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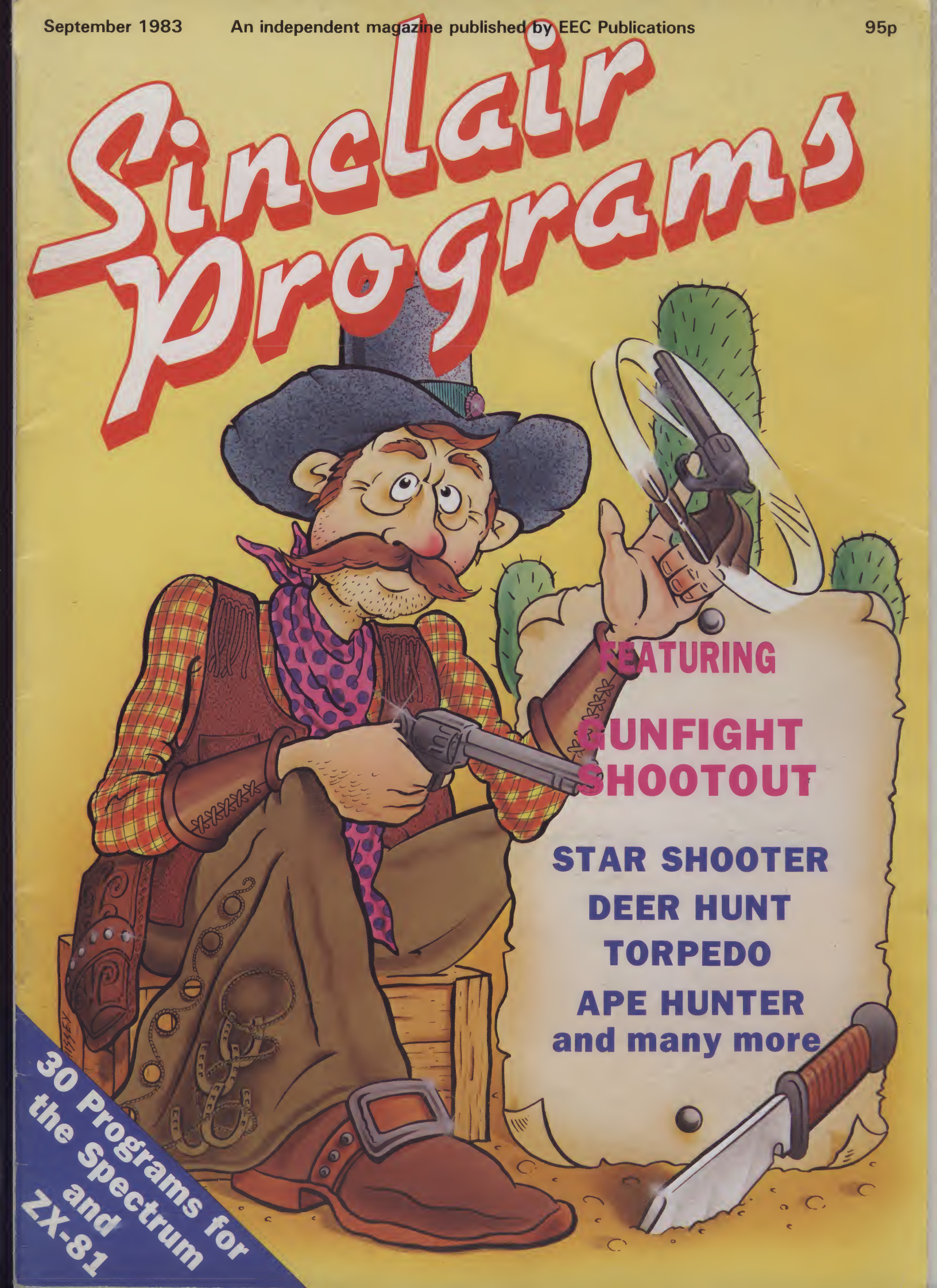
Sinclair Programs



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Bring your Spectrum to life with the fastest, meanest and most colourful arcade action around. Your task is to zap the relentless waves of alien attackers as they obliterate the force field protecting your supply of ion laser cannons. KEMPSTON JOYSTICK COMPATIBLE
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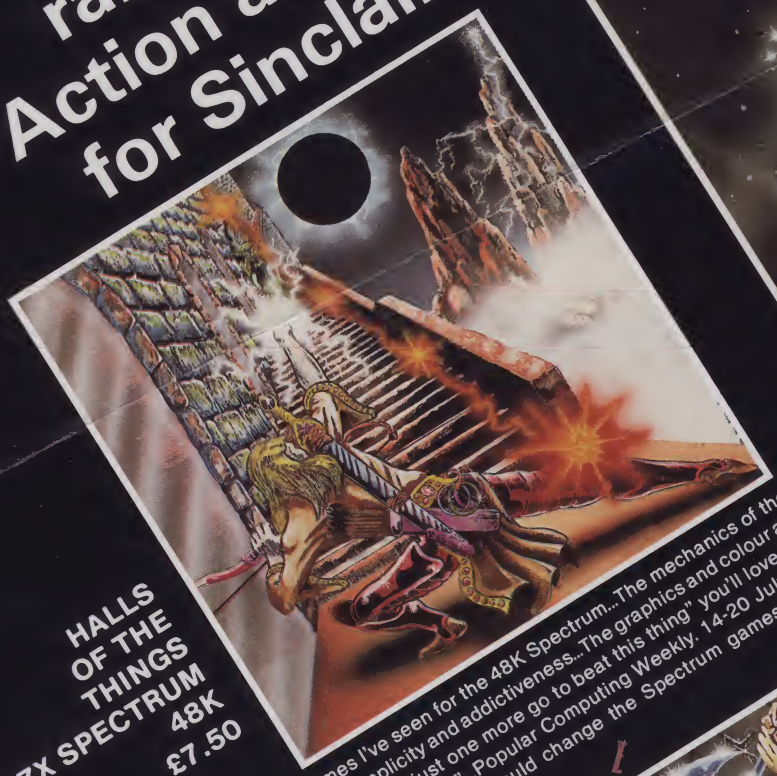

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"Spectacular...One of the best arcade games I've seen for the 48K Spectrum...The mechanics of the game are superb, finely balanced between simplicity and addictiveness..The graphics and colour are superb...If you enjoy sitting up until 4am having "just one more go to beat this thing" you'll love this game - I CAN'T RECOMMEND IT HIGHLY ENOUGH"...Popular Computing Weekly. 14-20 July. 1983.
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8 ERRORS AND MISHAPS

ZX-81

7 FLYING SCOTSMAN
11 HANG GLIDER
20 APE HUNTER
21 81 INVADERS
24 BADGER
26 TORPEDO
29 BLAST FROM THE PAST
33 ROULETTE
34 KLONG
37 RUBBISH
40 CITY LANDER
41 GUNFIGHT
50 STAR SHOOTER
52 TAKE NOTE
54 EXCHANGE RATE

SPECTRUM

9 GOOD FOR ROSES
10 3D
12 DRIVER
13 PROTECTOR
19 JANNIS THE MENACE
22 SOUND SEQUENCER
25 WORD PROCESSOR
27 RADAR GRID

30 PROGRAM OF THE MONTH SHOOT OUT

35 DEERHUNT
38 TARANTULA
47 SILVERMAN THE SAILOR
48 AWARI
51 KAMI
53 BANANA LEAP

To help with entering graphics characters we have adapted a system of writing the characters for the ZX-81. We indicate inverse characters by the letter i and graphics by g, so that an inverse letter W is shown as iW and the graphics character on key 6 is denoted by g6.
Spaces are shown by sp and inverse spaces are isp. If some occur together, for instance a row of six spaces, they are shown by 6★sp and where there is a combination of characters each one is divided by a colon, thus sp:isp:6★g6 means a space followed by an inverse space and then six characters on the 6 key.
Where whole words are written in inverse letters they appear in the listings as lower-case letters.
In the Spectrum listings, letters to be entered in graphics mode are underlined, while other graphics instructions are underlined and take the form shown above, with the addition that inverse graphics characters are represented by the letters "ig".

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ZX KEYBOARD FOR USE WITH 81 SPECTRUM

Our new cased keyboard has 52 keys, 12 of which are used for the numeric pad. The numeric pad offers useful features, you can cursor with one hand and it will be a boon for anyone who enters a lot of numeric data. The pad is a repeat of the 1 – 9 keys, it also has a full stop and a shift key. The numeric pad keys are red in colour, the normal keyboard keys are grey, with the case being black, which results in making the keyboard very attractive. The keyboard case dimensions are: 15" x 9" x 2½". The computer (either 80/81 or Spectrum), fits compactly inside.

You will have to remove the computer from it's original case, it is then screwed to the base of the case. The case has all the bosses already fitted and the screw holes are marked. Also fitted inside the case is a mother board (81 model only) which allows 16K, 32K and 64K to be fitted in the case. All connectors are at the rear of the case i.e. Power, Mic, Ear, T.V. and the expansion part. The case is large enough for other add-ons also to be fitted inside. One of these could be the power supply then you could very quickly fit a mains switch or a switch on the 9V line. This means you have a very smart contained unit.This case does not stop you from using any other add-ons that you may have eg Printer etc. We are convinced that this is the best keyboard available at present. It offers more keys and features than any other keyboard in it's price range.

NOTE...

The case can be purchased separately with the keyboard aperture uncut, therefore if you possess one of our early uncased keyboards, or in fact, any other suppliers' keyboards these could be fitted. The keyboard is connected to your computer by a ribbon cable and this has connectors fitted which simply push into the Sinclair connectors. It is a simple two minute task and requires no electronic skills. This keyboard does not need any soldering. Please specify on order whether you require the ZX81 or Spectrum case.

SPECTRUM MODEL

This is supplied with Spectrum legends, and a slightly different base for fitting the Spectrum inside, again, all the connectors are at the rear of the case and there is plenty of room for the power supply (and other add-ons). Should you wish to change, we can supply both the Spectrum legends and details of updating your case which will enable modification from the ZX81 to Spectrum. PLEASE specify on your order whether you require the ZX81 or Spectrum inside.

£45

MEMORY FOR ZX 81

16K Memory £22.95
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16K (Uncased) £19.95
64K (Uncased) £49.95

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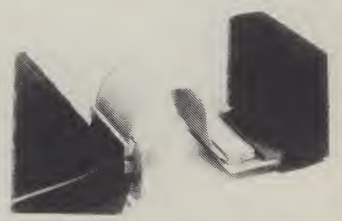
If you have ever had white outs or system crashes this could be the answer. It stops the movement between the computer and the RAM expansion, it is supplied with a ribbon 6 inches long, with a male connector at one end and a female at the other.



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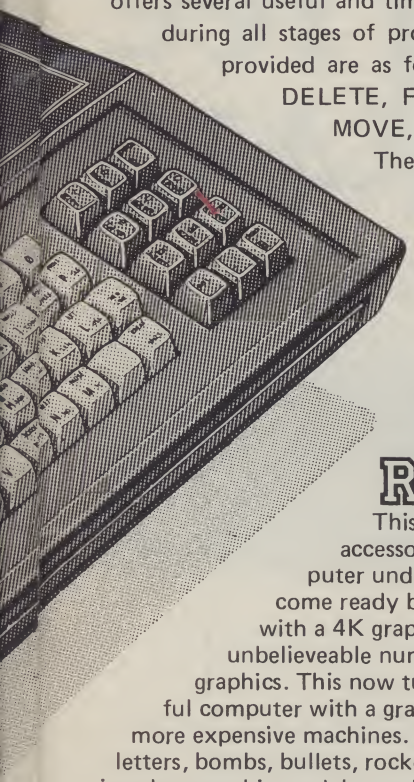
ZX 80/81 SPECTRUM HARDWARE

SPECTRUM/81 TOOLKIT BOTH AT ONLY £6.95

This is the toolkit which won acclaim in the feature in the August 1982 issue of Sinclair User. "It is the most impressive programm, fast in execution with clear and full instructions . . . . it stands out from the rest of the field". The ZXED is a powerful editor for use on the expanded ZX81. It is intended for use by the serious BASIC programmer and offers several useful and time saving features most helpful during all stages of program development. The facilities provided are as follows: ALTER, BYTES, COPY, DELETE, FIND, HELP, INSERT, KEEP, MOVE, RENUMBER, AND VERIFY.

The Spectrum Toolkit contains most of the features above plus autoline numberer and append, and will run in the 16K and 48K Spectrum.



4K GRAPHICS ROM £24.95

This module unlike most other accessories fits neatly inside your computer under the keyboard. The module come ready built fully tested and complete with a 4K graphic ROM.This will give you an unbelieveable number of extra pre-programmed graphics. This now turns the 81 into a very powerful computer with a graphic set rarely found on larger more expensive machines. In the ROM are lower case letters, bombs, bullets, rockets, tanks, a complete set of invaders, graphics and that only accounts for about 50 of them, there are still approximately 400 left (that may give you an idea as to the scope of the new ROM). However, the module does not finish there, it also has a spare holder on the board which will accept a further 4K of ROM/RAM. This holder can be fitted with a 1K/2K/RAM and can be used for user definable graphics so you can create your own custom character sets.

SPECTRA-SOUND

The so called speaker in your Spectrum is really only a 'buzzer'. With the DK Tronics "SPECTRA SOUND" you can generate fully amplified sound through the speaker on your T.V. set. SPECTRA-SOUND is a very simple but highly effective add-on. This means that you no longer have a faint beep but a highly amplified sound, which can be adjusted with the TV volume control.

The SPECTRA SOUND fits compactly and neatly inside the Spectrum case and is connected by three small crocodile clips.

NEW AT ONLY £9.95

£19.95 Light Pen

LIGHT PEN

The pen enables you to produce high resolution drawings on your own T.V. screen. The controlling software supplied with the light pen has 16 pre-defined instructions. These are chosen from a menu positioned at the bottom of the screen next to the pen.

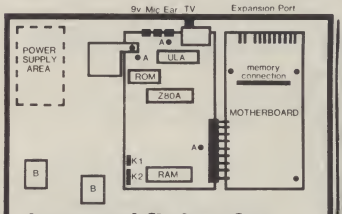
You can utilise the menu for changing colour (Border, Paper, Ink). Drawing circles, arcs, boxes, lines. You are also able to fill any object with any colour, and insert text onto the screen at any chosen place. Of course you can also draw freehand. There is a feature to retain the screens and animate. On the 48K Spectrum you can retain 5 screens.

You can also use the machine code on it's own in your own programs, for selecting out of a menu etc. The software provided will return with the X,Y, cords for it's position on the screen.

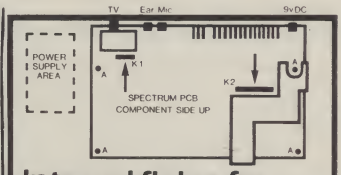
The light pen is supplied with a control interface in order to adjust the sensitivity/pen alignment.

This simply plugs into the ear socket on your spectrum.

Should you require further details please send a S.A.E.



Internal fixing for ZX 81 keyboard case.



Internal fixing for spectrum keyboard case.

Please state type of machine, which ROM memory size, quantity, and place when ordering.

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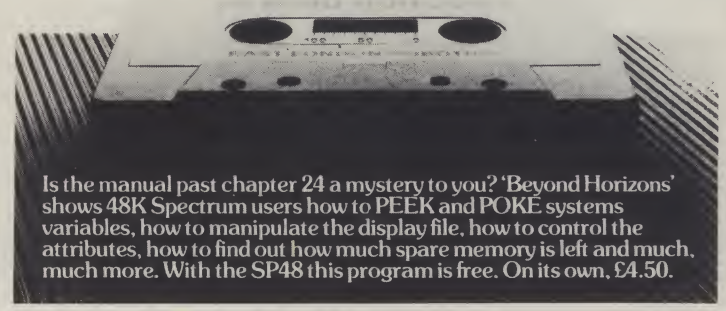
Extend your 16k Spectrum to 48k for just £23·00. And get a Free program worth £4·50 into the bargain.



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Now, our SP48 offers even better value.

Because now, we're not only offering you the facility to up-grade your 16K Spectrum to 48K, we're also offering you the opportunity to be able to utilise this vastly extended memory quickly and easily.

For £23 all you need to do is plug the chip-set into the sockets provided by Sinclair on your issue 2 (or £35 for issue 1) and you have a standard 48K Spectrum fully compatible with all Sinclair add-ons and very low in power consumption.

There is no soldering required.

Fitting and removal are easy.

And the SP48 carries our full warranty and is upgradable, on a part exchange basis, to SP80.

Then all you need to do is LOAD our specially written 48K guide program, 'Beyond Horizons', and your 48K computer will guide you through its memory.

With no need to labour through manuals.

This will save you time, because we all know how easy it is to get lost with memory maps.

SP80 Paged 64K memory extension — £46

The fitting, power consumption and add-on compatibility are identical to the SP48 (Issue 1 Version £50).

It can be used as a standard 48K, but software instructions can switch to a second page of 32K.

But this is not recommended for the complete beginner.

Yet it is of tremendous benefit to the serious user. And an SP80 FORTH compiler will be available in late September.

For a fit and test service at our premises £3, and by registered post £7.

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The MAXIMEM 32 and 64K is a modified ZX81 and not just a RAM pack. It fits inside the case.

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FLYING SCOTSMAN

DRIVE THE **Flying Scotsman** the 400 miles from London to Edinburgh in your scheduled time. You are required to input the throttle regulator setting every 10 miles and your choice of setting will be based on several factors. If there is slack or a station ahead you must brake immediately.

Watch the pressure guage—it must not fall below 150. Watch your speed; it must not exceed 100 or fall below 0. Make sure that your setting takes the gradient ahead into account. Finally, make sure that you are keeping close to your schedule. Arriving four hours late is just as much a failure as stalling en route.

Flying Scotsman was written for the 16K ZX-81 by Ian Kemp of Abingdon, Oxfordshire.

```
   1 SLOW
   2 PRINT AT 0,5;"4472 flyin9 s
cotsman"
   3 PRINT AT 3,0;"TODAY YOU HAV
E THE PRIVILEGE OF DRIVING THIS
FAMOUS TRAIN FROM  LONDON TO EDI
NBURGH."
   4 PRINT AT 7,6;"DISTANCE IS 4
00 MILES AND SCHEDULED TIME 450
MINUTES WITH ONE STOP, AT NEWCAS
TLE."
   5 PRINT AT 11,0;"YOU ALSO HAV
E SPEED RESTRICTIONSFOR THREE MA
JOR STATIONS AND TWOTRACK REPAIR
S."
   6 PRINT AT 15,0;"TYPE ANY KEY
 TO CONTINUE."
   9 IF INKEY$="" THEN GOTO 9
  10 CLS
  11 PRINT "THE REGULATOR IS A T
HROTTLE- IT CONTROLS THE STEAM F
LOW."
  12 PRINT AT 4,0;"REGULATOR SET
TINGS 0 TO 8; BRAKE WITH -1 AT a
ll SLACKS/STATIONS. MOST POWER I
S REQUIRED TO ACCELERATE FROM SL
ACKS, ESPECIALLY UP-HILL. LINE S
PEED LIMIT 100 MPH."
  13 PRINT AT 10,0;"FULL BOILER
PRESSURE IS 220 PSI.IF YOU DRIVE
 TOO HARD, PRESSURE FALLS AND YO
U WILL RAPIDLY LOSE POWER."
  14 PRINT AT 15,0;"NOTE THAT 1
IN 200 IS A STEEP   GRADIENT BY
RAILWAY STANDARDS."
  15 PRINT AT 18,0;"HAVE A GOOD
TRIP."
  16 PRINT AT 20,0;"TYPE ANY KEY
 TO CONTINUE."
  18 IF INKEY$="" THEN GOTO 18
  19 CLS
  20 PRINT AT 0,5;"4472 flyin9 s
cotsman"
  25 LET M=0
  26 LET T=0
  30 LET H=0
  33 LET V=0
  35 LET S=11
  40 LET P=220
  45 DIM Z(7)
  48 RAND 0
  50 LET Z(6)=INT (37*RND)*10+10
  55 LET Z(7)=INT (37*RND)*10+10
  60 RAND 197
  71 LET Z(1)=260
  72 LET Z(2)=390
  73 LET Z(3)=70
  74 LET Z(4)=320
  75 LET Z(5)=180
  80 PRINT AT 4,4;"MILES FROM LO
NDON";AT 5,11;"ALTITUDE "
  85 PRINT AT 7,0;"SCHEDULED TIM
E";TAB 22;"ACTUAL"
  90 PRINT AT 10,2;"boiler Press
ure"
  95 PRINT AT 13,2;"re9ulator Po
sition"
 100 PRINT AT 18,0;"(1sP:32*9h)"
 105 PRINT AT 19,0;"(1sP:5*sP:9s
:8*sP:9f:5*sP:1sP:3*sP:9B:5*sP:1
sP)"
 110 PRINT AT 20,0;"KINGS PETER-
  YORK  NEW-   EDIN-"
 115 PRINT AT 21,0;"CROSS BOROUG
H       CASTLE  BURGH"
 125 PRINT AT 4,0;M;AT 5,20;INT
H;" FEET   "
 130 PRINT AT 8,9;"SPEED ";INT V
;" M.P.H. "
 150 PRINT AT 10,18;P;" P
 160 PRINT AT 2,0;"
                    "
 200 IF M=400 THEN GOTO 900
 205 LET HN=RND*500
 210 IF M=390 THEN LET HN=0
 215 LET G=52000/(HN-H)
 220 LET H=HN
 225 PRINT AT 6,0;"NEXT GRADIENT
1 IN ";INT G;"    "
 230 FOR N=1 TO 7
 235 IF M=Z(N) THEN GOTO 700
 240 NEXT N
 245 INPUT R
 250 IF R>8 OR R<0 AND R<>-1 THE
N GOTO 245
 255 LET A=(220*P*SQR R/6-8000)/
(V+30)-25000/G-V*V/150-300/(V+1)
 260 LET M=M+10
 265 LET Q=V*V+20*A
 270 IF Q<0 THEN GOTO 650
 275 LET TD=60*(SQR Q-V)/A
 280 LET V=SQR Q
 285 IF V>105 THEN GOTO 850
 290 LET P=P-(R-3)/0.5
 292 IF P<150 THEN GOTO 640
 295 LET T=T+TD
 300 LET S=S+10+400/G
 310 IF P>220 THEN LET P=220
 320 LET X=INT (0.0775*M-0.45)
 330 PRINT AT 18,X;"(9h:1sP)"
 355 IF R<=0 THEN GOTO 601
 360 IF R=8 THEN GOTO 600
 370 PRINT AT 13,21;R;"/8     "
 375 PRINT AT 7,15;INT S;" MN";T
AB 29;INT T
 380 GOTO 125
 600 LET R$="FULL    "
 601 IF R<0 THEN LET R$="BRAKING
"
 602 IF R=0 THEN LET R$="CLOSED
"
 605 PRINT AT 13,21;R$
 610 GOTO 375
```

```
 640 PRINT AT 2,0;"brakes leaked
 on"
 645 PAUSE 200
 650 PRINT AT 2,0;"you have stal
led"
 655 IF V=0 THEN GOTO 890
 660 LET T=T+15+300/V
 665 LET P=P+10
 670 LET V=0
 680 GOTO 300
 700 LET M=M+10
 710 LET VN=20
 715 IF N<=4 THEN LET VN=40
 717 IF N<=2 THEN GOTO 755
 720 PRINT AT 2,0;"slack ahead "
;VN;" M.P.H."
 725 INPUT R
 730 IF R<>-1 THEN GOTO 850
 732 IF N=4 THEN PRINT AT 2,0;"b
erwick ] welcome to scotland"
 733 PAUSE 100
 735 LET TD=1200/(V+VN)
 740 LET V=VN
 745 LET S=S+115/(V+10)
 750 GOTO 290
 755 PRINT AT 2,0;"station ahead
"
 760 LET VN=0
 770 GOTO 725
 850 FAST
 855 CLS
 860 PRINT AT 2,0;"you have cras
hed]excessive speed"
 870 GOTO 2005
 890 PRINT "YOU ARE STUCK. ANOTH
ER ENGINE IS SENT TO HELP YOU.
                 "
 896 LET T=T+100
 900 LET E=INT (T-S)
 901 PAUSE 500
 903 CLS
 905 GOTO 1000+E*2
1000 PRINT "GOOD RUN MATE"
1001 STOP
1020 PRINT "NOT BAD MATE"
1021 STOP
1060 PRINT "POOR RUN I*M AFRAID"
1061 STOP
2000 PRINT " YOU ARE VERY LATE..
.. ALL THE PASSENGERS COMPLAINE
D."
2005 PRINT AT 4,4;"YOU ARE DEMOT
ED TO CLEANING STEPHENSONS ROCKE
T."
2010 STOP
```

ERRORS AND MISHAPS

LINE 18 of **Frogger** on page 38 of the July issue should read: 18 PRINT "(i*)".

The asterisk shown on line 1530 of **Lacemaker** on page 12 should be an inverse asterisk.

On lines 1300 and 1310 of **Astral Foxgloves** on page 13, only the second "b"' and the second "c" should be underlined.

In **Grumphers** (page 22) line 400 contains a graphic C, line 830 a graphic A, line 840 a graphic B, and line 850 a graphic D.

The top halves of the hoops in **Hoop-La** on page 35 are made up of graphic A and B, and the bottom halves are made up of graphic C and graphic D.

Line 20 of **Light Cycles,** page 37, contains 32 graphic As and 30 graphic Bs.

The diagonal line which appears on line 1090 of **Personal Finance** on page 47 represents a £ sign.

Line 50 of **Monsters,** page 49, contains a graphic F and a graphic I, line 2110 contains 32 graphic As, line 2140 a graphic B, and line 3000 a graphic C.

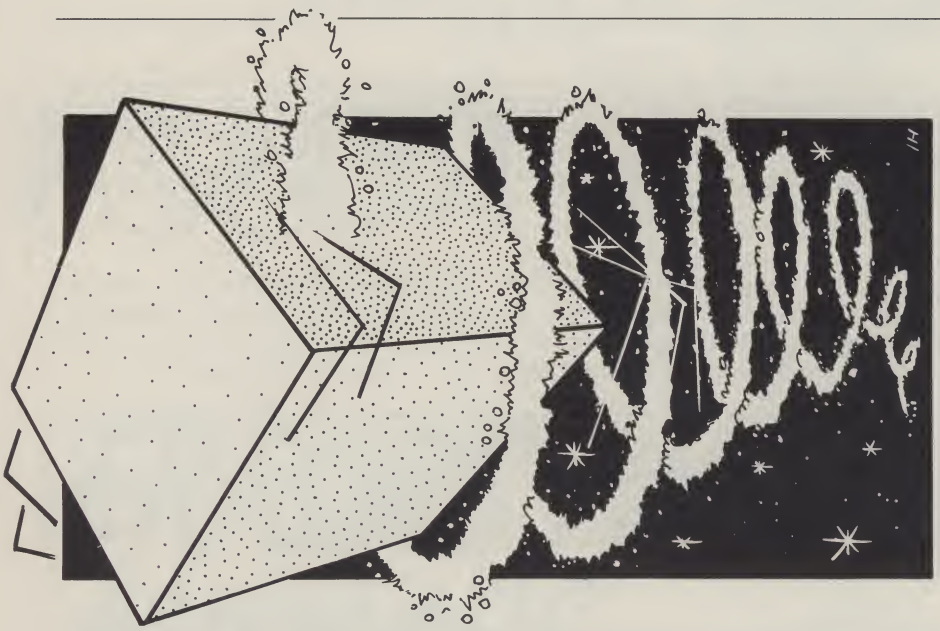
GOOD For The ROSES

YOU PLAY the part of an enthusiastic gardener, determined to make all your roses bloom in the time allowed. To do so you have sought fertiliser and found a supplier in the form of a carthorse. Move yourself with the usual cursor keys to pick up the evil-smelling green lumps with a shovel and place them at the foot of your rose stalks. **Good for the Roses** was written for the 16K Spectrum by P Greenwood of Torrisholme, Morecambe.

```
  10 GO SUB 9000
  20 GO SUB 8000
  30 GO SUB 7000
  40 GO SUB 6000
  50 LET t=t-1
  60 PRINT INK 3;AT 1,6;t;" "
  70 IF t=0 THEN GO TO 4000
  80 GO TO 30
4000 INPUT "PRESS ENTER TO PLAY
AGAIN";W$
4010 GO TO 20
5000 PRINT FLASH 1;AT 21,10;" WE
LL DONE "
5100 GO TO 4000
5500 PRINT AT hy-1,hhx;"    ";AT
 hy,hhx;" AB ";AT hy+1,hhx;" CD
"; INK 2; FLASH 1; OVER 1;AT hy+
1,hhx+1;"NO"
5510 FOR q=0 TO -30 STEP -1
5520 BEEP .05,q
5530 NEXT q

5540 GO TO 4000
6000 LET x1=x+(INKEY$="8" AND x<
30)-(INKEY$="5" AND x>0)
6010 LET y1=y+(INKEY$="6" AND y<
19)-(INKEY$="7" AND y>3)
6020 IF y=y1 AND x=x1 THEN RETUR
N
6030 PRINT AT y,x;" ";AT y+1,x;"
 "
6040 IF ATTR (y1,x1)>56 OR ATTR
(y1+1,x1)>56 THEN LET y1=y: LET
x1=x
6050 IF ATTR (y1+1,x1+1)>127 THE
N LET s=1: GO TO 6080
6060 IF ATTR (y1+1,x1+1)>56 THEN
 LET y1=y: LET x1=x
6080 PRINT INK 1;AT y1,x1;"E";AT
 y1+1,x1;"FG"
6090 IF s=1 THEN PRINT INK 4; OV
ER 1; FLASH 1;AT y1+1,x1+1;"H"
6100 IF ATTR (y1,x1+2)<>58 AND s
=1 AND y1=19 AND x1>0 THEN PRINT
 INK 2;AT 19,x1+2;"J": LET s=0:
LET r=r+1
6110 PRINT INK 3;AT 1,29;r
6120 IF r=10 THEN GO TO 5000
6130 LET x=x1: LET y=y1
6140 RETURN
7000 LET hx=hx+1
7010 IF hx=30 THEN LET hx=32
7020 IF hx=62 THEN LET hx=64
7030 IF hx=94 THEN LET hx=0
7040 IF hx<31 THEN LET hy=3: LET
 hhx=hx
7050 IF hx>31 AND hx<63 THEN LET
 hy=10: LET hhx=hx-32
7060 IF hx>63 THEN LET hy=17: LE
T hhx=hx-64
7070 IF hx=32 THEN PRINT AT 3,30
;"  ";AT 4,30;"  "
7080 IF hx=64 THEN PRINT AT 10,3
0;"  ";AT 11,30;"  "

7090 IF hx=0 THEN PRINT AT 17,30
;"  ";AT 18,30;"  "
7100 IF ATTR (hy,hhx+1)=57 OR AT
TR (hy+1,hhx+1)=57 THEN GO TO 55
00
7105 IF ATTR (hy,hhx+2)=57 OR AT
TR (hy+1,hhx+2)=57 THEN GO TO 55
00
7110 PRINT AT hy,hhx;" AB";AT hy
+1,hhx;" CD"
7115 IF hhx=0 THEN GO TO 7130
7120 IF RND>0.98 THEN GO SUB 750
0
7130 RETURN
7500 PRINT INK 4; FLASH 1;AT hy+
1,hhx;"H"
7510 FOR q=1 TO 20
7520 BEEP .01,-20: BEEP .01,-10
7530 NEXT q
7540 RETURN
8000 BORDER 5: CLS
```

```
8005 LET t=500
8010 PRINT PAPER 2; INK 7;AT 0,1
0;" HORSE-MUCK "
8020 PRINT INK 3;AT 1,1;"TIME=";
t;AT 1,23;"ROSES=0"
8030 PRINT INK 2;AT 6,3;"L(isP)M
 L(isP)M";AT 6,12;"L(isP)M";AT 6
,20;"L(isP)M L(isP)M L(isP)M"
8040 PRINT INK 6;AT 7,3;"K(isP)K
 K(isP)K";AT 7,12;"K(isP)K";AT 7
,20;"K(isP)K K(isP)K K(isP)K"
8050 PRINT INK 6;AT 8,3;"(isP)K(
isP) (isP)K(isP)";AT 8,12;"(isP)
K(isP)";AT 8,20;"(isP)K(isP) (is
P)K(isP) (isP)K(isP)"
8060 PRINT INK 2;AT 13,1;"L(isP)
M L(isP)M";AT 13,13;"L(isP)M L(i
sP)M";AT 13,25;"L(isP)M"

8070 PRINT INK 6;AT 14,1;"K(isP)
K K(isP)K";AT 14,13;"K(isP)K K(i
s)K";AT 14,25;"K(isP)K"
8080 PRINT INK 6;AT 15,1;"(isP)K
(isP) (isP)K(isP)";AT 15,13;"(is
P)K(isP) (isP)K(isP)";AT 15,25;"
(isP)K(isP)"
8090 FOR q=3 TO 30 STEP 3
8091 PRINT INK 4;AT 20,q;"I"
8092 NEXT q
8100 PRINT AT 3,1;"AB";AT 4,1;"C
D"
8110 PRINT INK 1;AT 19,0;"E";AT
20,0;"FG"
8120 LET x=0: LET y=19: LET hx=0
: LET hy=3
8130 LET r=0
8140 LET s=0
8200 RETURN
9000 FOR a=USR "a" TO USR "o"+7
9010 READ b: POKE a,b
9020 NEXT a
9030 RETURN
```

```
9110 DATA 0,0,0,0,127,255,255,25
5
9120 DATA 8,28,58,127,243,224,22
4,224
9130 DATA 127,192,160,160,144,14
4,72,0
9140 DATA 224,32,80,72,136,132,6
8,0
9150 DATA 0,56,56,16,48,88,148,8
4
9160 DATA 88,20,18,41,72,132,132
,198
9170 DATA 0,0,0,0,128,64,60,0
9180 DATA 0,0,0,0,24,60,0,0
9190 DATA 8,8,8,8,8,8,8,8
9200 DATA 0,0,60,126,126,255,189
,28
9210 DATA 255,195,195,195,195,19
5,195,195
9220 DATA 0,3,7,15,31,63,127,255

9230 DATA 0,192,224,240,248,252,
254,255
9240 DATA 0,0,0,0,0,3,183,255
9250 DATA 0,0,0,0,0,98,187,255
```

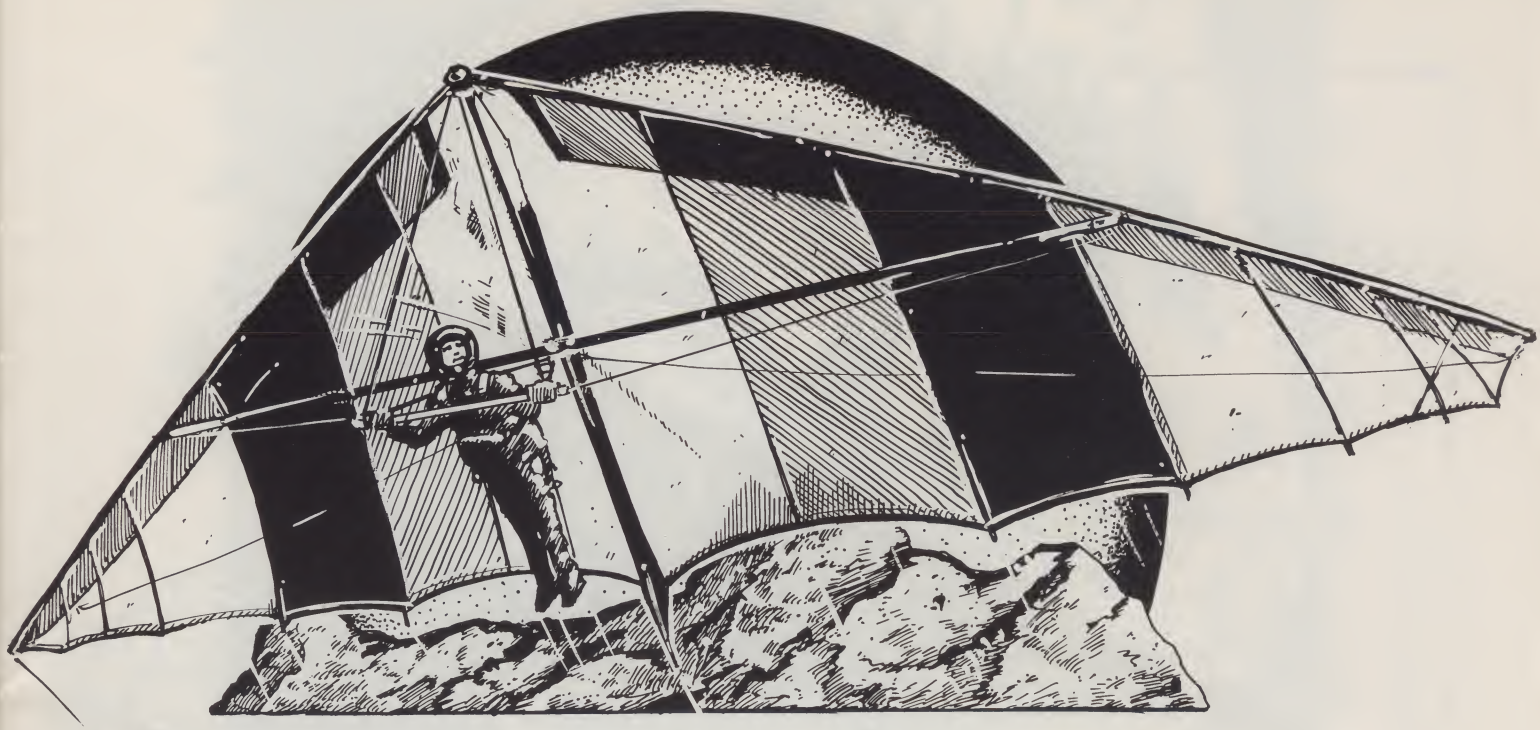


3D CUBE

```
  1 LET d=80: LET e=20
  2 LET a=80: LET b=100: LET c=
130
  5 FOR z=0 TO 40
 10 CLS : PLOT a,a: DRAW 50,0:
DRAW 0,50: DRAW -50,0: DRAW 0,-5
0
 20 PLOT b,b: DRAW 50,0: DRAW 0
,50: DRAW -50,0: DRAW 0,-50
 30 PLOT d,d: DRAW b-a,b-a
 40 PLOT 130,d: DRAW e,b-a
 50 PLOT d,130: DRAW b-a,e
 60 PLOT 130,130: DRAW e,e
 70 LET b=b-1: LET e=e-1: LET c
=c+1
 80 PAUSE 10
 90 NEXT z
100 LET d=80: LET e=20
102 LET a=80: LET b=60: LET c=9
0
105 FOR z=0 TO 40

110 CLS : PLOT a,a: DRAW 50,0:
DRAW 0,50: DRAW -50,0: DRAW 0,-5
0
120 PLOT b,b: DRAW 50,0: DRAW 0
,50: DRAW -50,0: DRAW 0,-50
130 PLOT d,d: DRAW b-a,b-a
140 PLOT 130,d: DRAW -e,b-a
150 PLOT d,130: DRAW b-a,-e
160 PLOT 130,130: DRAW -e,-e
170 LET b=b+1: LET e=e-1: LET c
=c-1
180 PAUSE 10
190 NEXT z
```

THE GRAPHICS on a 16K Spectrum are limited but they can be used for far more than variations on a space invader. Ashley Munson of Watton-at-Stone, Hertfordshire has written **3D Cube** which draws a cube on the screen and rotates it.

This creation of large three-dimensional characters seems to be an area neglected by Spectrum programmers. We would like to see programs generating or utilising this form of graphics.



HANG GLIDER

TRY to LAND your fast-descending hang-glider on the safe landing pad and thus avoid being wrecked on the surrounding jagged mountains. Move left with key 5, and right with key 8.

Hang Glider was written for the 16K ZX-81 by C Stainton of Bransholme, Hull.

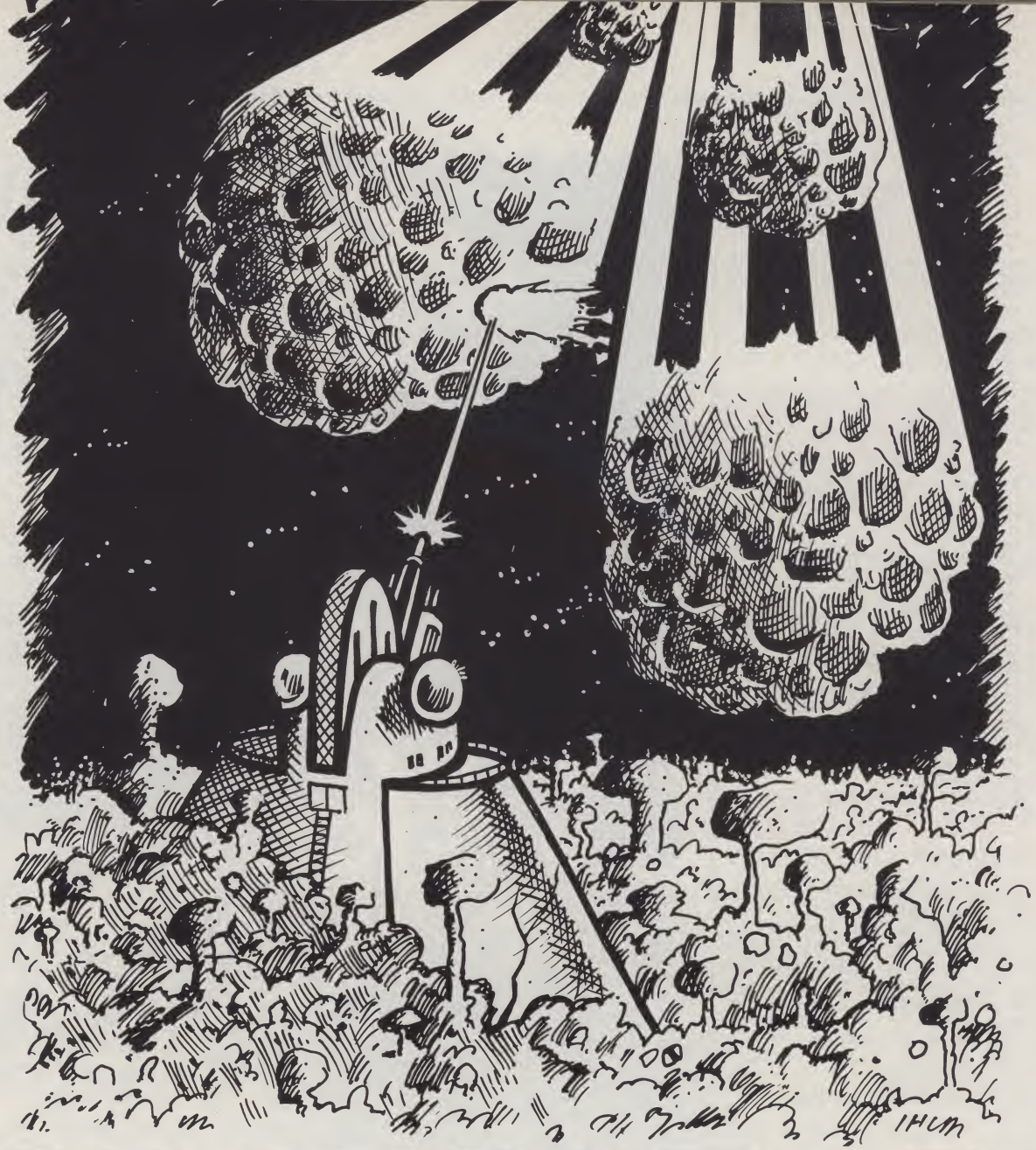
```
   2 PRINT AT 10,3;"WOULD YOU LI
KE INSTRUCTIONS"
   3 PRINT AT 11,10;"Y/N"
   4 PAUSE 4E4
   5 IF INKEY$="Y" THEN GOTO 260
   6 IF INKEY$="N" THEN GOTO 10
  10 LET A=0
  20 LET B=15
  30 LET C=INT (RND*31)
  31 IF C=15 OR C=16 OR C=17 OR
C=14 THEN LET C=31
  35 CLS
  40 PRINT AT 21,0;"(32*isp)"
  50 PRINT AT 20,0;"(99:9w:sp:96
:sp:99:9w:9w:sp:98:96:95:sp:sp:9
w:99:9w:98:sp:sp:96:95:sp:99:9w:
99:9w:99:9w:99:9w)"
  60 PRINT AT 20,C;"(9f)"
  70 PRINT AT A,B;"*"
  80 PRINT AT A,B;"."
  90 LET B=B-(INKEY$="5")+(INKEY
$="8")
 100 LET A=A+1
 110 IF A=20 AND B=C THEN GOTO 1
40
 120 IF A=21 THEN GOTO 180
 130 GOTO 70
 140 FOR T=0 TO 20
 150 PRINT AT 10,5;"you landed y
our hanglider ";AT 10,5;"YOU LAN
DED YOUR HANGLIDER "
 160 NEXT T
 170 GOTO 210
 180 PRINT AT A,B;"(sp:98:95)";A
T A-1,B;"(9y:9d:9d:9t)"
 190 PRINT AT 10,0;"YOU WERE TOR
N TO BITS ON THE    JAGGED MOUNT
AINS"
 195 PAUSE 4E4
 200 GOTO 210
 210 CLS
 220 PRINT AT 10,5;"ANOTHER GAME
(Y/N)"
 230 PAUSE 4E4
 240 IF INKEY$="Y" THEN GOTO 1
 250 IF INKEY$="N" THEN STOP
 260 CLS
 270 PRINT AT 0,7;" HANGLIDER "
 280 PRINT AT 1,7;"(11*9s)"
 285 PRINT "THE OBJECT OF THE GA
ME IS TO    LAND YOUR HANGLIDER
ON THE LAND- STRIP."
 290 PRINT "YOU MUST DO THIS WIT
HOUT CRASH- ING INTO THE MOUNTAI
NS."
 300 PRINT "USE KEYS- 5 AND 8 TO
 MOVE LEFT-  AND RIGHT"
 303 PRINT AT 18,5;"PRESS ANY KE
Y TO START."
 305 PAUSE 4E4
 310 CLS
 320 GOTO 10
 330 SAVE "HANGLIDEr"
 340 RUN
```

```
  1 REM "DRIVER" by COLIN BIRD
  3 PAPER 0: BORDER 0: INK 7
  4 LET l=2: GO SUB 290: GO SUB
300
  5 LET r$="bb          bb"
  6 LET a=9
  7 LET s=0
 10 FOR n=0 TO 20: PRINT "(32*1
98)": NEXT n: PRINT "bbbbbb(10*1
98)bbbbbbbbbbbbbbbbb"
 20 LET r1=5
 30 FOR g=0 TO 200
 40 LET s=s+1
 50 IF RND>.2 THEN PRINT AT INT
 20,INT (RND*30); INK 7; INVERSE
 1;"h"
 60 IF RND>.9 THEN PRINT AT INT
 20,r1+INT (RND*4); INK 6; INVER
SE 1;"c"
 70 IF g=100 THEN BEEP .1,1: BE
EP .1,2: BEEP .1,3: BEEP .1,1: I
NK 6: LET r$="bb          bb"
 80 IF g=250 THEN BEEP .1,1: BE
EP .1,2: BEEP .1,2: BEEP .1,10:
INK 5: LET r$="bb        bb"
 90 IF g=400 THEN BEEP .1,-10:
BEEP .1,-8: BEEP .1,-6: BEEP .1,
-10: INK 6: LET r$="bb    bb"
 100 IF g=550 THEN BEEP .1,0: BE
EP .1,-10: BEEP .1,0: BEEP .1,-1
0: INK 5: LET r$="bb   bb"
 110 IF g=700 THEN BEEP .1,0: BE
EP .1,10: BEEP .1,-10: BEEP .1,-
10: INK 5: LET r$="bb  bb"
 120 LET a=a+(INKEY$="0")-(INKEY
$="8")
 130 BEEP .002,0: BEEP .002,1
 140 POKE 23692,255
 150 PRINT AT 21,31;"  "
 160 IF r1>=18 THEN LET r1=18
 170 IF r1<=1 THEN LET r1=1
 180 PRINT AT 21,r1; PAPER 2; IN
VERSE 1;r$
 190 PRINT AT 9,a; INVERSE 1;"a"
 200 LET r1=r1+INT (RND*3): LET
r1=r1-INT (RND*3)
 210 IF ATTR (10,a)=6 THEN BEEP
.2,10: BEEP .1,-10: BEEP .1,0: L
ET s=s+30: PRINT AT 10,a;"■"
 220 IF SCREEN$ (10,a)<>" " THEN
 GO SUB 250
 230 NEXT g: CLS : FOR n=0 TO 10
: BEEP .1,INT (RND*60): NEXT n:
GO TO 10
 240 STOP
 250 LET l=l-1: FOR n=0 TO 5: BE
EP .2,-10: PRINT AT 10,a; FLASH
1;"b": BEEP .2,-1: PRINT AT 10,a
; FLASH 1;"a": NEXT n
 260 IF l>1 THEN GO SUB 290: NEX
T g
 270 IF l<=0 THEN CLS : BEEP .01
,-10: PRINT AT 10,10;"NO LIVES L
EFT";AT 15,10;"SCORE= ";s: PRINT
 AT 21,0; FLASH 1;"ANY KEY TO CO
NTINUE": IF INKEY$="" THEN PAUSE
 0: PAUSE 10: RUN
 280 LET r1=5: INK 7: FOR n=0 TO
 20: PRINT "(32*1g8)": NEXT n: P
RINT "bbbbbb(10*1g8)bbbbbbbbbbbb
bbbb"
 290 RETURN
 300 FOR f=0 TO 1
 310 FOR n=4 TO 7: INK n
 320 BEEP .02,n+n
 330 PRINT AT 0,13;"DRIVER";AT 1
,12;"cccccccc"
 340 PRINT '''" You must drive a
long the road   for as long as P
ossible without hitting the rock
s (h),and also  collecting the h
ags of money    for extra points
"
 350 PRINT '" You have only 2 li
ves"
 360 PRINT '' FLASH 1;"KEYS"' FL
ASH 0;" '8' is left,"'" '0' is r
ight."
 370 NEXT n: NEXT f
 380 PRINT AT 21,10; FLASH 1;"AN
Y KEY TO START": IF INKEY$="" TH
EN GO TO 380
 385 CLS : RETURN
 390 FOR q=1 TO 3: READ a$: FOR
n=0 TO 7: READ a: POKE USR a$+n,
a: NEXT n: NEXT q
 400 CLS : RETURN
 410 DATA "a",44,110,223,247,239
,247,110,52,"h",14,126,94,127,25
3,127,90,60,"c",126,60,102,219,1
45,223,195,126
 420 CLS : PRINT AT 10,10; FLASH
 1;"STOP THE TAPE": PAUSE 200: R
UN
 500 SAVE "DRIVER" LINE 420
```

DRIVER

MOVE YOUR CAR along the road, steering left with 8 and right with 0. Do not crash into the side of the road or you will lose one of your two lives. Run over bags of money to gain extra points. A change in the colour of the road will be heralded by a small bleeping sound and each time the road colour changes it will also become narrower.

Driver was written for the 16K Spectrum by Colin Bird of Blackpool, Lancashire.



PROTECTOR

YOU ARE in control of a laser tower on the surface of a planet which must be protected by falling meteors. Each time you hit a meteor you gain 10 points but you lose five energy units. You gain five units each time a meteor hits the surface of the planet. If a meteor reaches the reactor at the bottom of the screen you will be destroyed. Move left with "R" and right with "T".

Protector was written for the 16K Spectrum by David Perahia of Kings Langley, Hertfordshire.

```
   5 LET H$=0
  10 DATA 0,0,0,34,103,247,255,2
55,255,255,255,195,195,255,255,2
55,0,0,31,63,127,255,255,255,0,0
,248,252,254,255,255,255,128,192
,224,246,246,224,192,128,1,3,7,1
11,111,7,3,1
  15 DATA 0,62,63,127,255,254,12
0,48,128,32,1,4,16,64,10,144
  30 FOR n=144 TO 151
  35 FOR i=0 TO 7: READ z: POKE
USR CHR$ n+i,z: NEXT i
  40 NEXT n
 100 GO TO 7000
 500 LET O=0
 505 LET E=200: LET sc=0
1000 PAPER 0: INK 0: BORDER 0: B
RIGHT 1: CLS
1001 INK 7: BRIGHT 1: PLOT 200,1
75: DRAW 40,-40,2
1004 INK 7: BRIGHT 1: CIRCLE 50,
149,16: FOR N=0 TO 60: INK 7: PL
OT INT (RND*255),INT (RND*40)+13
5: BEEP .005,0: NEXT N
1005 INK 6: PAPER 0: PRINT AT 17
,0;"3333333333333333333333333333
3333"
1010 PRINT AT 18,0;"32*isp"

1015 PAPER 0: INK 5: PRINT AT 19
,0;"bbbbbbbbbbbbbbbbbbbbbbbbbbbb
bbbb"
```

```
1020 PRINT AT 20,0; INK 0; PAPER
 5;"
   "
1025 INK 2: PAPER 0: PRINT AT 21
,0;"cdcdcdcdcdcdcdcdcdcdcdcdcdcd
cdcd"
1030 FOR n=14 TO 19: PRINT AT n,
15; INK 5; PAPER 0;"bb": NEXT n
1035 PRINT AT 14,14; INK 5; PAPE
R 0;"f"

1040 PRINT AT 14,17; INK 5; PAPE
R 0;"e"
1045 INK 5: PRINT AT 10,10;"HIGH
 SCORE - ";HS
1050 FOR N=0 TO 30: BEEP .02,N:
BEEP .02,N-5: BEEP .03,N+5: NEXT
 N
1060 INK 0: PAPER 0: BRIGHT 1: P
RINT AT 10,10;"
"
2000 IF E<0 THEN LET E=0
2002 PRINT £1;AT 1,0; BRIGHT 1;"
SCORE ";SC: PRINT £1; INK 7; BRI
GHT 1;AT 1,16; INK 7; BRIGHT 1;"
ENERGY ";E;" "
2004 LET n=INT (RND*32)
2005 FOR g=7 TO 21
2010 PRINT AT g-1,n; INK 0; PAPE
R 0; BRIGHT 1;" "

2011 IF INKEY$="" THEN GO TO 202
0
2013 IF e<=0 THEN GO TO 2020
2014 IF N>13 THEN GO TO 2017
2016 IF INKEY$="r" OR INKEY$="R"
 THEN INK 7: PLOT 108,60: DRAW -
108,0: INK 0: PLOT 108,60: DRAW
-108,0: GO SUB 9000
2017 IF N<18 THEN GO TO 2020
2018 IF INKEY$="t" OR INKEY$="T"
 THEN INK 7: PLOT 148,60: DRAW 1
00,0: INK 0: PLOT 148,60: DRAW 1
00,0: GO SUB 9000
2020 IF ATTR (g,n)<>64 THEN GO T
O 5000
2022 INK 6: BRIGHT 1: PRINT AT g
,n;"g"
2025 NEXT g
5000 LET E=E+5

5005 IF n=14 OR n=15 OR n=16 OR
n=17 THEN FOR p=0 TO 4: PRINT AT
 g-1,n; INK 7;"h": BEEP .02,0: B
EEP .02,1: NEXT p: PRINT AT g-1,
n; PAPER 0; INK 0; BRIGHT 1;" ":
 GO TO 2000
5025 IF G=21 THEN PRINT AT G-1,N
;" ": GO TO 5060
5050 FOR P=0 TO 4: PRINT AT g,n;
 INK 7;"h": BEEP .02,0: BEEP .02
,1: NEXT P: PRINT AT g,n; INK 0;
 BRIGHT 1; PAPER 0;" ": IF G<>21
 THEN GO TO 2000
5061 FOR N=-10 TO 20: BEEP .02,1
0: PRINT AT 21,0; INK 6; PAPER 0
; BRIGHT 1;"cdcdcdcdcdcdcdcdcdcd
cdcdcdcdcdcd"
5062 BEEP .02,15: PRINT AT 21,0;
 INK 2; PAPER 0; BRIGHT 1;"cdcdc
dcdcdcdcdcdcdcdcdcdcdcdcdcd"

5063 BEEP .02,N+15: PRINT AT 21,
0; INK 7; PAPER 0; BRIGHT 1;"cdc
dcdcdcdcdcdcdcdcdcdcdcdcdcd":
NEXT N
5070 GO TO 9999
7000 PAPER 0: BORDER 0: BRIGHT 1
: INK 7: CLS
7005 PRINT AT 0,11;"PROTECTOR";T
AB 11;"---------"
7010 LET H$=STR$ HS: PRINT AT 0,
3; INK 7;"*HI*";AT 0,23;"*00000*
";AT 0,32-3-LEN H$;HS
7015 INK 7: PRINT AT 3,0;"YOU CO
NTROL A LASER TOWER ON THESURFAC
E OF A PLANET WHICH HAS TOBE DEF
ENDED FROM FALLING METEORS"
7020 PRINT AT 8,0;"YOU GET 10 PO
INTS FOR EACH HIT  BUT YOU ALSO
LOSE 5 ENERGY UNITSYOU GAIN FIVE
 UNITS EACH TIME A METEOR HITS T
HE PLANET SURFACE"

7025 PRINT AT 15,0;" IF A METEOR
 HITS THE REACTOR AT THE BOTTOM
OF THE SCREEN,THE     PLANET WILL
 BE DESTROYED"
7030 PRINT AT 19,0;"/ / / / TO
 FIRE LEFT / RIGHT": INK 5: PRIN
T AT 19,1;"R";AT 19,7;"T"
7040 PRINT AT 21,5; INK 7;"PRESS
 ANY KEY TO PLAY"
7042 IF INKEY$<>"" THEN GO TO 50
0
7044 GO TO 7042
7999 PAUSE 0

8000 INK 7: LET A$="YOUR PLANET
HAS BEEN DESTROYED": LET B$="  Y
OU MANAGED TO SCORE "
8005 FOR N=1 TO LEN A$: PRINT A$
(N);: BEEP .05,20: NEXT N
8007 FOR N=0 TO 100: NEXT N
8010 PRINT : PRINT : FOR N=1 TO
LEN B$: PRINT B$(N);: BEEP .05,2
0: NEXT N
8015 LET s$=STR$ sc: INK 7: FLAS
H 0: PRINT AT 2,LEN B$;"00000";A
T 2,31-LEN s$-3;sc: FOR N=0 TO 3
0: BEEP .01,N+5: BEEP .01,n-5: N
EXT N
8016 IF SC<=HS THEN LET I=250
8017 INK 7: IF SC>HS THEN PRINT
AT 10,0; FLASH 1;"YOU HAVE BEATE
N THE HIGH SCORE": LET I=400: LE
T HS=SC
8020 FOR N=0 TO I: NEXT N

8025 INK 7: BRIGHT 1: CLS : PRIN
T AT 1,2;"----------------------
------";TAB 0;"DO YOU WANT TO PL
AY AGAIN (Y/N)";TAB 2;"---------
-------------------"
8030 IF INKEY$="Y" OR INKEY$="y"
 THEN GO TO 7000
8035 IF INKEY$="N" OR INKEY$="n"
 THEN STOP
8040 GO TO 8030
9000 LET E=E-5
9005 IF g=14 THEN FOR p=0 TO 4:
BEEP .02,20: BEEP .02,19: PRINT
AT g,n; INK 7;"h": NEXT p: LET O
=O+1: LET sc=sc+10: PRINT AT g,n
; INK 0; BRIGHT 1; PAPER 0;" "
9006 IF O=10 THEN LET E=E+25: LE
T O=0
9007 IF g=14 THEN GO TO 2000
9010 RETURN
9998 GO TO 2000

9999 BRIGHT 1: FOR N=0 TO 10: PA
PER 7: CLS : PAPER 0: CLS : NEXT
 N: GO TO 8000
```

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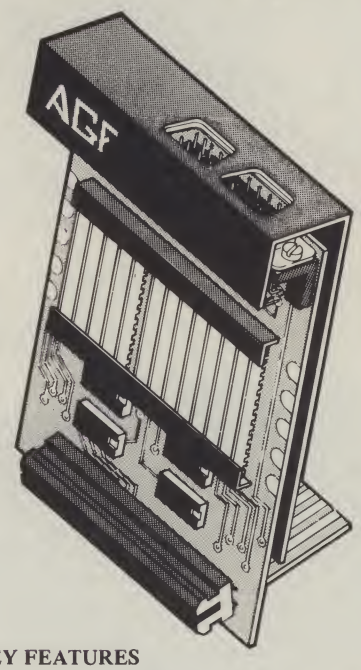

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```
  5 PRINT AT 10,7; INK 3; PAPER
 6; FLASH 1; BRIGHT 1;"Stop the
tape!!"
  10 GO TO 9000: REM Graphics an
d Instructions
  15 REM Set up variables
  20 LET sc=0: LET time=500
  25 LET cans=8
  30 LET cat=15
  39 LET st=0: LET stone=0
  40 REM set up display
  41 LET c$=" e ": LET d$=" f "
  42 LET g$="mno": LET h$="pqr"
  45 FOR b=5 TO 9 STEP 2
  50 PRINT AT b,0; INK 2;"ababab
abababababababababababbababa
bababababababababababa"
  60 NEXT b
  65 LET y$="ik ": LET z$="jl "
  70 LET a$="  c   c   c   c   c
 c   c   c   d   d   d   d   d
 d   d   d  "
  73 LET cop=29
  75 PRINT AT 3,0; INK 4;a$
  80 PRINT AT 20,cat; INK 0;c$;T
AB cat; INK 0;d$
  90 LET cat=cat+(INKEY$="7" AND
 cat<29)-(INKEY$="6" AND cat>0)
  99 IF st<>0 THEN GO TO 101
 100 IF INKEY$="0" AND d$<>" g "
 THEN LET st=18: LET d$=" g ": L
ET stone=cat
 110 IF d$=" g " AND st<>0 AND (
st>10 OR st<4) THEN PRINT OVER 1
;AT st,stone+1;"h"
 111 IF d$=" g " THEN LET st=st-
1
 115 IF d$=" g " AND (st>9 OR st
<4) THEN PRINT AT st+1,stone+1;"
 "
```

KNOCK THE CANS off the wall before granny arrives with her Demon Wacker Slipper. When you have cleared the wall of cans you have a chance to knock off the policeman's helmet before more cans appear. Watch for that slipper.

Jannis the Menace was written by George and Matthew Law of Sutton Coldfield, West Midlands for the 16K Spectrum.

Jannis The Menace

```
 120 IF d$=" g " AND st=0 THEN P
RINT AT 0,0;"
                  ": LET d$=" f "
 130 PRINT AT 1,0;"Score=";sc
 140 LET time=time-1
 150 PRINT AT 1,20;"Time=";time;
" "
 156 IF time=0 THEN BEEP .1,10:
FOR n=27 TO cat STEP -1: PRINT A
T 20,n;g$;" ";AT 21,n;h$;" ": BE
EP .1,50: BEEP .2,-50: BEEP .3,0
: NEXT n: PRINT AT 21,0;"Ow!!!!!
!!!!!!!!!": GO TO 1000
 158 IF cans=0 THEN GO TO 190
 160 IF st=4 AND a$(stone+34)="d
" THEN LET sc=sc+10: LET cans=ca
ns-1: LET a$(stone+34)=" ": BEEP
 .003,40: BEEP .003,59
 170 GO TO 80
 190 IF cop>0 THEN PRINT AT 4,IN
T cop;z$;AT 3,INT cop;y$
 200 LET cop=cop-.5
 210 IF INT cop=0 THEN LET sc=sc
-40: LET cans=8: GO TO 70
 220 IF st=4 AND (stone=INT cop
OR stone=INT cop+1) THEN LET sc=
sc+100: LET time=time+150: BEEP
.1,30: BEEP .7,40: BEEP .5,50: L
ET cans=8: CLS : PAUSE 5: GO TO
45
 300 GO TO 170
1000 REM To see if you want anot
her go
1010 INPUT "Do you want another
go(y/n)?";R$
1015 IF R$="n" OR R$="N" THEN ST
OP
1020 IF R$="y" OR R$="Y" THEN CL
S : INPUT "Do you want instructi
ons?";s$
1030 IF s$="y" OR s$="Y" THEN GO
 TO 9900
1040 IF s$="n" OR s$="N" THEN GO
 TO 15
1050 CLS : GO TO 1020
9000 FOR n=144 TO 161
9010 FOR f=0 TO 7
9020 READ b: POKE USR CHR$ n+f,b
: NEXT f: NEXT n
9030 DATA -1,-1,128,128,128,128,
128,-1,-1,-1,1,1,1,1,1,-1
9040 DATA -1,-1,-1,195,195,195,1
95,195,195,195,195,195,195,-1,-1
,-1
9050 DATA 0,195,195,246,246,189,
189,153,153,153,153,129,195,102,
60,0,129,195,102,60,0,0,0,0
9060 DATA 0,0,24,60,60,24,0,0
9070 DATA 1,1,3,7,15,15,15,27,19
,51,35,35,99,67,-1,-1,128,128,19
2,224,240,240,240,248,248,252,25
2,252,254,254,-1,-1
9080 DATA 0,0,0,0,0,0,15,63,0,0,
0,15,28,124,-1,-1,0,0,0,0,0,12,6
2,254,127,-1,-1,63,15,0,0,0,-1,-
1,-1,-1,252,0,0,0,-1,-1,-1,31,31
,0,0,0
9900 REM Instructions
9901 PAUSE 150: CLS : PRINT FLAS
```

```
H 1;AT 0,7;"Jannis the Menace"
9910 PRINT "     (no relation to
 Dennis)    The object of this g
ame is to   knock the cans off t
he the wall before your Granny C
omes with   her elephant hide De
mon Wacker  Slipper!!!
            The controls are:-
                        6--Left
                        7--Right
                        0--Fire"
9920 PRINT AT 21,0;"Press any ke
y to continue": PAUSE 0: BEEP 1,
10: BEEP .5,-30: CLS
9921 PRINT "You can only fire a
stone when  the catapult looks l
ike this e
          f. When you have cleare
d a sheet   of cans you will hav
e a chance  to get some more tim
e before    granny comes.You do
this by     knocking the policem
ans hat off before he reaches th
e other side of the wall if he r
eaches the  other side you will
lose forty  points!!
             If there are no can
s left and  the police man's hat
 does not   appear then there is
 an         invisible can somewh
ere on the  wall you have to fin
d it,you maysee the can disappea
ring.                   Good luck
"
9922 PRINT AT 21,0;"Press any ke
y to continue": PAUSE 0: BEEP 1,
10: BEEP .5,-30: CLS
9999 GO TO 15
```

APE HUNT

MOVE YOURSELF, the plus sign, up and down the screen with the usual cursor keys until you are in line with the approaching ape. When you are both in the same position press "F" to catch the ape. After catching 10 apes your time will be displayed.

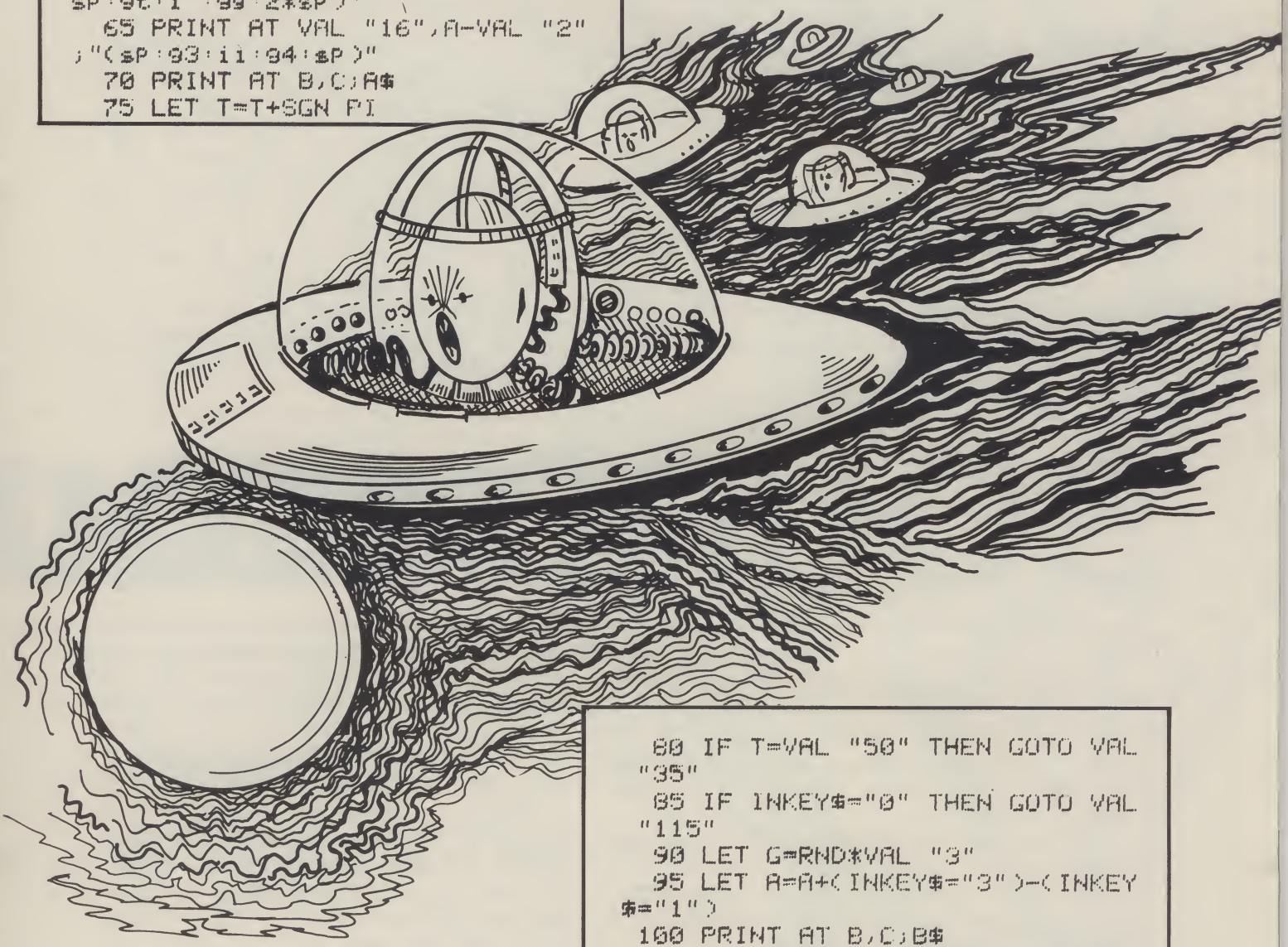
The personal best time of Martin Booth of Halifax, Yorkshire who wrote the program for the 16K ZX-81, is 87.

```
  2 LET B=0
  3 LET Z=0
  4 LET D=15
  5 LET E=INT (RND*10)
  6 LET F=INT (RND*5)+12
  7 FOR A=0 TO 21
  8 LET C=14
 10 PRINT AT A,0;"(isp:9a:28*is
p:9a:isp)",
 15 NEXT A
 18 PRINT AT 1,5;"SCORE=";Z
 19 PRINT AT 1,20;"TIME=";B
 20 PRINT AT 10,2;"(9f:26*9a:9f
)"
 21 PRINT AT 9,10;"(9a:8*sp:9a)
"
 22 PRINT AT 8,11;"(9a)HUNTER(9
a)"
 23 PRINT AT 7,12;"(9a:4*sp:9a)
"
 24 PRINT AT 6,13;"(9a:2*sp:9a)
"
 25 PRINT AT 5,14;"(2*9a)"
 26 PRINT AT 4,14;"(98:95)"
 30 PRINT AT D,C;"+";AT D,C;"(i
sp)"
 33 LET B=B+1
 35 PRINT AT F,27;"(3*isp)"
 40 LET D=D+(INKEY$="6")-(INKEY
$="7")
 44 IF D=21 THEN LET D=20
 45 IF D=11 THEN LET D=12
 50 PRINT AT F,E;"(isp:9y:93:is
p)"
 55 LET E=E+1
 60 IF F=D AND E=C AND INKEY$="
F" THEN GOSUB 200
 65 IF E=27 THEN LET E=3
100 GOTO 30
200 LET Z=Z+1
205 IF Z=10 THEN PRINT AT 12,8;
"your time was ";B
206 IF Z=10 THEN LET D=D-1
207 PRINT AT D,C;"++";AT D+1,C;
"(2*isp)"
208 IF D=5 THEN GOTO 220
210 IF Z=10 THEN GOTO 205
215 GOTO 4
220 PRINT AT D,C;"(2*i+)";AT D,
C;"++"
230 GOTO 220
300 SAVE "j"
310 RUN
```

```
10 REM "E"
15 LET S=PI-PI
20 LET A=VAL "12"
25 LET B=PI-PI
30 LET C=VAL "3"
35 CLS
40 LET T=S
45 LET B=B+VAL "2"
50 IF B=VAL "16" THEN PRINT S;
" HITS";X
55 LET A$="(2*sp:gy:i":gt:sp:g
t:i":gy:sp:gy:i":gt:sp:gt:i":gy:
sp:gy:i":gt:2*sp)"
60 LET B$="(2*sp:gt:i":gy:sp:g
y:i":gt:sp:gt:i":gy:sp:gy:i":gt:
sp:gt:i":gy:2*sp)"
65 PRINT AT VAL "16",A-VAL "2"
;"(sp:g3:ii:g4:sp)"
70 PRINT AT B,C;A$
75 LET T=T+SGN PI
```

THE INVADERS descend slowly, speeding as you fire at them. Move left with "1", right with "3", and fire with "0". How many aliens can you hit before you are annihilated?

81 Invaders was written by Gary Shields for the 1K ZX-81.



```
80 IF T=VAL "50" THEN GOTO VAL
"35"
85 IF INKEY$="0" THEN GOTO VAL
"115"
90 LET G=RND*VAL "3"
95 LET A=A+(INKEY$="3")-(INKEY
$="1")
100 PRINT AT B,C;B$
105 LET C=C+((G>=1.5) AND C<VAL
"7")-((G<1.5) AND C>SGN PI)
110 GOTO VAL "65"
115 PRINT AT B,A;"+"
120 IF A$((A-C)+SGN PI)<>"(i")"
THEN GOTO VAL "65"
125 LET A$(A-C TO A-C+2)="   "
130 LET B$(A-C TO A-C+2)="   "
135 PRINT AT B,A-SGN PI;"***"
140 LET S=S+SGN PI
145 IF A$="
   " THEN GOTO VAL "55"
150 GOTO VAL "65"
```

81 INVADERS

```
 10 DIM b$(9,32,3)
 20 LET c=-24: LET cs=-23: LET
d=-22: LET ds=-21: LET e=-20: LE
T f=-19: LET fs=-18: LET g=-17:
LET gs=-16: LET a=-15: LET as=-1
4: LET b=-13
 100 CLS : PRINT TAB 13; BRIGHT
1;"MENU"  PRINT AT 2,8; INK 1;"1
 Write Sequences"; INK 3;AT 6,8;
"2 Play sequences"; INK 0;AT 10,
8;"3 Load sequences";AT 14,8;"4
Save sequences"
 110 INPUT INK 3;"Your choice (1
 TO 4)?";choice
 120 IF (choice<>INT choice) OR
(choice>4 OR choice<1) THEN INPU
T INK 3;"You must enter a whole
number   between 1 and 4.TRY AGA
IN ";choice: GO TO 120
 130 GO TO choice*1000

1000 CLS : PRINT TAB 7; BRIGHT 1
;"Write sequences": PRINT INK 1;
AT 2,0;"Notes must be entered in
 the    form ""cs2"" or ""f 0"""
: PRINT AT 6,0;"""c"" is the let
ter name of the   note": PRINT A
T 9,0;""""s"" is whether the note
 is sharpor not"
1005 PRINT AT 14,0; INK 1;"-----
---------------------------- To e
nter a rest,type in ""rrr""  ---
------------------------------"
1007 PRINT AT 18,0; INK 2;"If yo
u want to change a sequenceenter
 ""change"" when you are     ask
ed ""note1?"""
1010 PRINT AT 12,0;"""2"" is the
 octave of the note    (0 TO 4)"
1020 INK 8: PLOT 0,64: DRAW 255,
0: DRAW 0,160-64: DRAW -255,0: D
RAW 0,-(160-64): INK 0
1030 INPUT "Sequence number (1 t
o 10)?";seq : IF seq<1 OR seq>10
 OR INT seq<>seq THEN GO TO 1030
1045 FOR u=1 TO 32: GO SUB 1050:
 NEXT u: GO TO 1090
1050 INPUT "note";(u);"?";a$: IF
 a$="change" THEN GO TO 1090
1053 IF a$="rrr" THEN LET b$(seq
,u)=a$: RETURN
1055 IF a$="" OR LEN a$<>3 THEN
GO TO 1050
1060 IF CODE a$<97 OR CODE a$>10
3 OR (a$(2)<>"s" AND a$(2)<>" ")
 OR CODE a$(3)<48 OR CODE a$(3)>
52 THEN PRINT AT 21,0; INK 3;"ER
ROR IN ENTRY:PLEASE RE-ENTER": B
EEP 2,25: PRINT AT 21,0;"
                              ": GO T
O 1050
1065 LET b$(seq,u)=a$
1070 RETURN
1080 NEXT u

1090 CLS : PRINT TAB 7; BRIGHT 1
;"Write sequences": FOR n=1 TO 1
6: PRINT n;":";TAB 4;b$(seq,n),n
+16;":";b$(seq,n+16): NEXT n
1095 INPUT "Any alterations(if y
es,enter thenote number which is
 incorrect, otherwise enter""0""
)";c$
1100 IF c$="0" THEN GO TO 100
1105 IF c$="" OR VAL c$<1 OR VAL
 c$>32 THEN GO TO 1090
1110 LET u=VAL c$: GO SUB 1050:
GO TO 1090
2000 CLS : PRINT TAB 9; BRIGHT 1
;"Play sequences"
2010 PRINT INK 1;"Whilst the mus
ic is playing,the sequence can b
e stopped by       pressing ""s""
"
2013 PRINT "If you want to retur
n to the    menu,enter""0""when
asked          ""sequence number?
"""
2015 INPUT "Sequence number? ";s
eq: IF seq<0 OR seq>9 THEN GO TO
 2015
2016 IF seq=0 THEN GO TO 100
2020 IF b$(seq,1,1)=" " THEN PRI
NT AT 21,0; INK 3;"Sorry;Empty s
equence.Try again": BEEP 2,30: P
RINT AT 21,0;"
                ": GO TO 2015
2025 PRINT AT 10,0;"Sequence num
ber:";seq
2030 INPUT "Tempo?";tem: IF tem<
=0 THEN PRINT AT 21,0; INK 3;"In
valid tempo (too small)": BEEP 2
,30: PRINT AT 21,0;"
                              ": GO TO 203
0
2035 PRINT AT 12,0;"Tempo:";tem

2040 PRINT INK 3;'"PRESS ANY KEY
 TO START": PAUSE 0
```

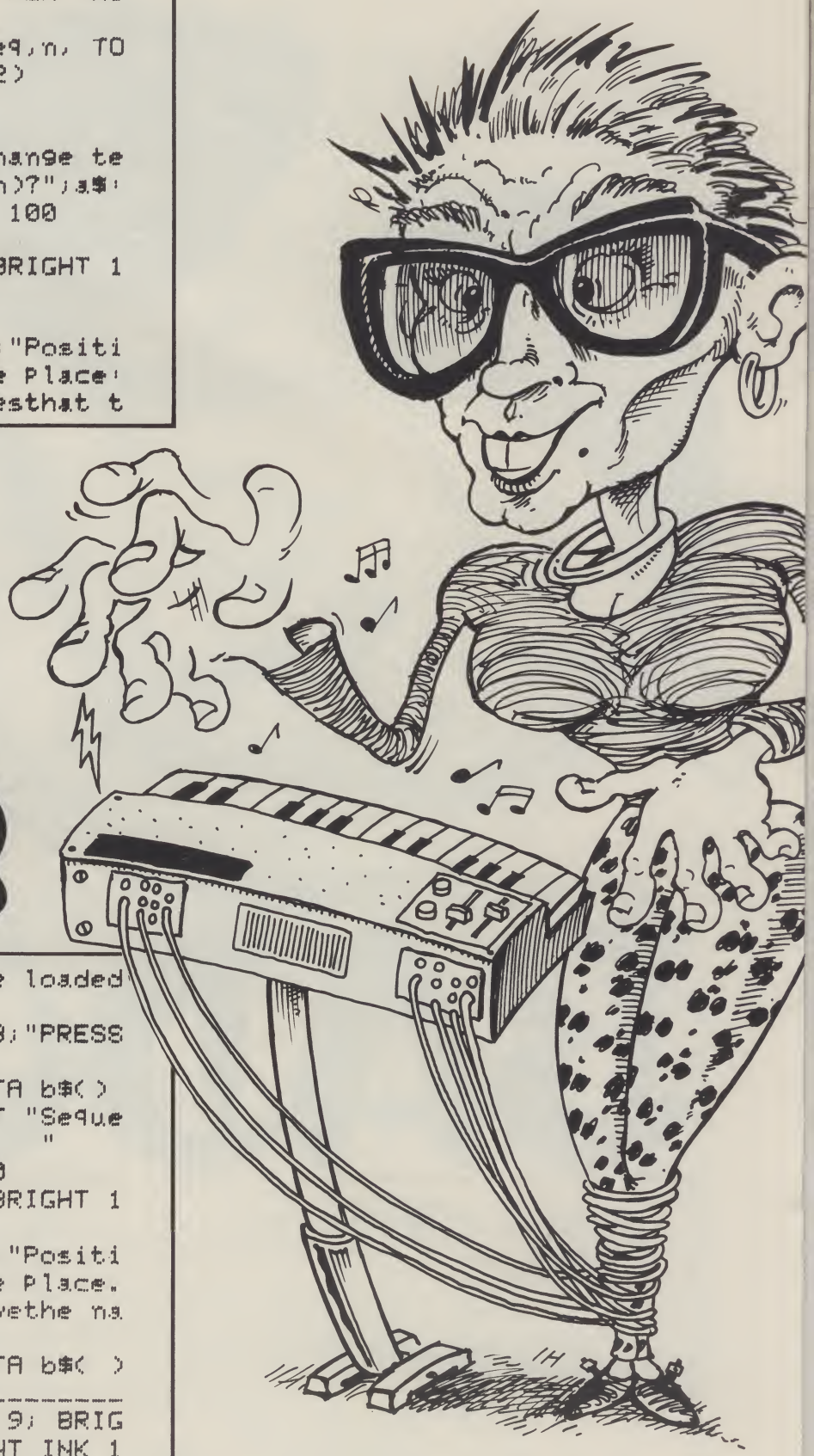
SOUND SEQU

```
2045 FOR n=1 TO 32
2050 LET z$=INKEY$: IF z$="s" TH
EN GO TO 2300
2060 IF b$(seq,n)="rrr" THEN PAU
SE 50/tem: GO TO 2080
2070 BEEP 1/tem,VAL b$(seq,n, TO
 2)+(VAL (b$(seq,n,3))*12)
2080 NEXT n
2090 GO TO 2045
2300 INPUT "Do want to change te
mpo or       sequence (y/n)?";a$:
 IF a$(1)="n" THEN GO TO 100
2310 GO TO 2000
3000 CLS : PRINT TAB 9; BRIGHT 1
;"Load sequences"

3010 PRINT AT 2,0; INK 1;"Positi
on tape at the appropiate place:
The first set of sequencesthat t
```

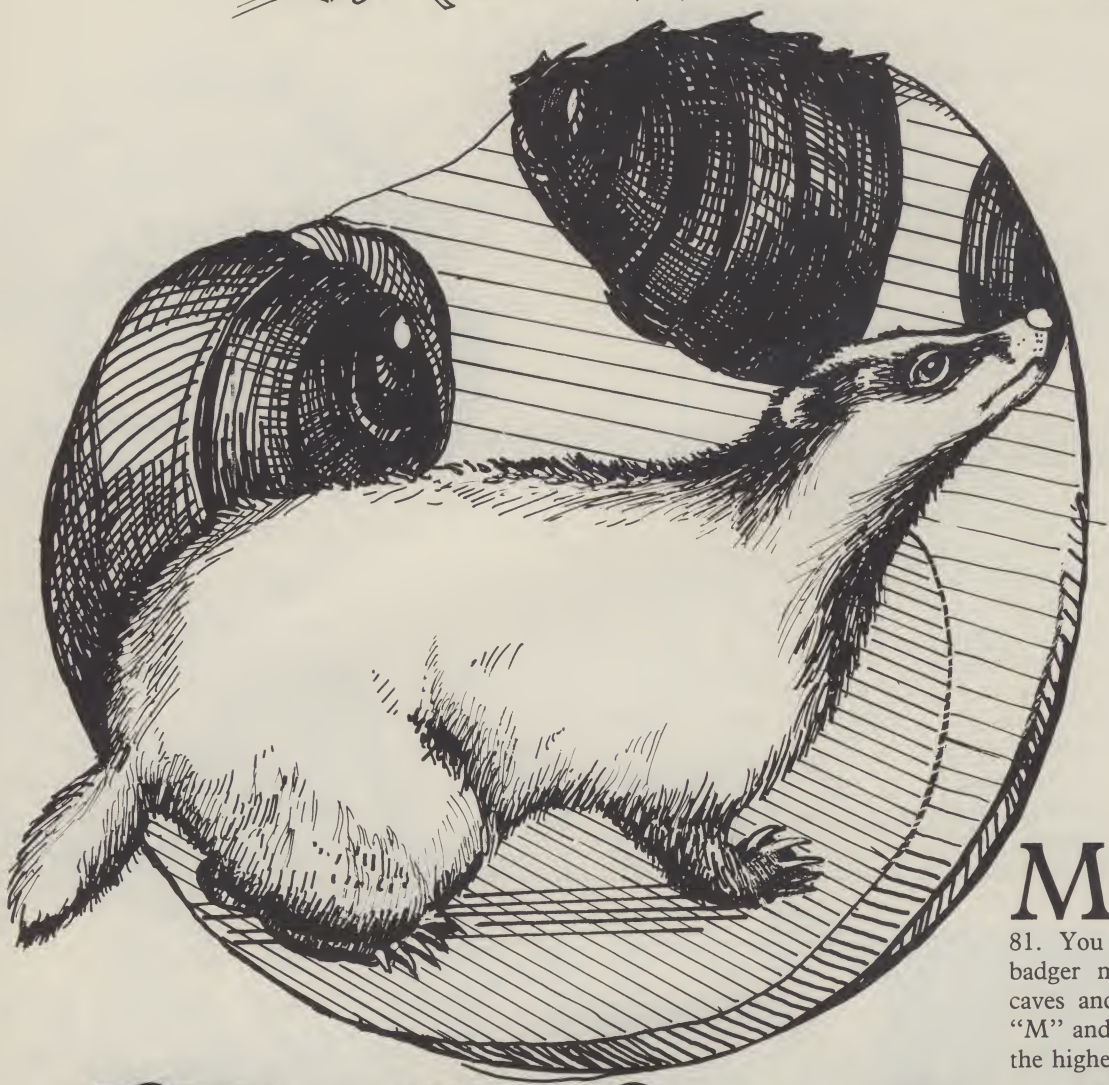
A SEQUENCER is usually used with a synthesiser, playing a repeated pattern of notes, employing the synthesiser to make the sounds. It splits a bar of music into 16 events, each containing either a note or a rest which lasts as long as the event.

S Hiller of Welling, Kent has written a program which allows you to compose two bars of music, to play them back repeatedly at a variety of tempos, and to load and save them (16K Spectrum).

ENCER



```
he computer finds will be loaded
"
3020 PRINT FLASH 1; INK 3;"PRESS
 ANY KEY TO START"
3030 LOAD "sequences" DATA b$( )
3040 PRINT CHR$ 11: PRINT "Seque
nces Loaded                    "
3050 PAUSE 100: GO TO 100
4000 CLS : PRINT TAB 9; BRIGHT 1
;"Save sequences"
4010 PRINT AT 2,0; INK 1;"Positi
on tape at the appropiate place.
All sets of sequences havethe na
me ""sequences"""
4020 SAVE "sequences" DATA b$( )
4030 PRINT "____________________
_______________": PRINT TAB 9; BRIG
HT 1;"Verification": PRINT INK 1
;"Position tape back to the
  beginning of the last set of
  sequences,and then start the
  tape running": VERIFY "": PRIN
T FLASH 1;"VERIFIED": PAUSE 100:
 GO TO 100
```



MARCEL FIDLER of Southampton, Hampshire submitted **Badger** for the 16K ZX-81. You play the part of a restless badger moving through underground caves and tunnels, steering with keys "M" and "N". The further you move, the higher your score.

BADGER

```
  2 FOR A =1 TO 10
  3 PRINT "(isP)      (isP)"
  4 NEXT A
  5 LET P =3
  6 LET S =0
  7 LET A=INT (RND*5+1)
  8 GOSUB 20
  9 GOSUB 24
 10 IF R=128 THEN GOTO 30
 11 IF RND<.7 THEN GOTO 8
 12 FOR A=1 TO 4
 13 SCROLL
 14 PRINT AT 9,0;"(isP)      (is
P)"
 15 IF RND<.3 AND A>1 AND A<4 T
HEN PRINT AT 9,P;"(isP)"
 16 GOSUB 24
 17 IF R=128 THEN GOTO 30
 18 NEXT A
 19 GOTO 7
 20 SCROLL
 21 PRINT AT 9,0;"(7*isP)"
 22 PRINT AT 9,A;" "
 23 RETURN
 24 PRINT AT 3,P;
 25 LET R=PEEK (PEEK 16398+256*
PEEK 16399)
 26 PRINT "+"
 27 LET S=S+1
 28 LET P=P+(INKEY$="M")-(INKEY
$="N")
 29 RETURN
 30 PRINT AT 4,P;"SCORE=";S
 35 RETURN
```

THIS PROGRAM by Rodney Muskett of Perranporth, Cornwall allows you to use your 48K Spectrum as a **Word Processor** for up to 160 lines of text. It includes clear instructions allowing you to enter text and then to load, save, display or edit that text. Lines must not exceed 32 characters or the ending will be lost.

WORD PROCESSOR

```
   2 REM ON 48K
   5 LET X=0: LET B=0: LET G=900
0: DIM A(3)
   6 DIM T$(160,32)
   7 CLS
  10 FOR F=1 TO 3
  20 GO SUB G
  30 PRINT AT 10,3;" INPUT ";A$;
AT 12,7;"COLOUR"
  40 LET G=G+2
  50 INPUT A(F)
  55 CLS
  60 NEXT F
  70 BORDER A(1): PAPER A(2): IN
K A(3)
  80 CLS
 150 CLS
 200 REM OPTIONS
 205 CLS : PRINT AT 1,5;"PRESS N
UMBER OF OPTION"
 210 PRINT AT 5,0;"OPTION 1";TAB
 10;"ENTER TEXT"

 215 PRINT
 220 PRINT "OPTION 2";TAB 10;"PR
INTOUT TEXT"
 225 PRINT
 230 PRINT "OPTION 3";TAB 10;"SA
VE TEXT"
 235 PRINT
 240 PRINT "OPTION 4";TAB 10;"LO
AD TEXT"
 245 PRINT
 250 PRINT "OPTION 5";TAB 10;"ED
IT TEXT"
 255 PRINT
 270 PRINT "OPTION 6";TAB 10;"EN
D"
 275 PRINT : PRINT "OPTION 7";TA
B 10;"PRINT TEXT ON SCREEN"
 280 IF INKEY$<>"" THEN GO TO 28
0
 290 IF INKEY$="" THEN GO TO 290

 300 IF INKEY$="1" THEN GO TO 10
00
 310 IF INKEY$="2" THEN GO TO 20
00
 330 IF INKEY$="3" THEN GO TO 30
00
 340 IF INKEY$="4" THEN GO TO 40
00
 350 IF INKEY$="5" THEN GO TO 50
00
 360 IF INKEY$="6" THEN GO TO 60
00
 365 IF INKEY$="7" THEN GO TO 70
0
 370 GO TO 290
 700 REM PRINT ON SCREEN
 705 CLS
 710 GO SUB 8000
 720 FOR F=1 TO X
 730 PRINT T$(F)
 740 NEXT F

 745 PRINT "PRESS ANY KEY TO CON
TINUE": PAUSE 0
 750 GO TO 200
1000 REM INPUT ROUTINE
1001 CLS
1002 GO SUB 9100
1005 LET C=1
1009 IF C=160 THEN PRINT "THAT W
AS YOUR LAST LINE": GO TO 200
1010 INPUT "TO END TYPE END ";T$
(C)
1020 IF T$(C)="END
                 " OR T$(C)="end
                              " THE
N GO TO 200
1030 PRINT T$(C)
1040 LET C=C+1
1050 GO TO 1009
2000 REM OUT PUT ROUTINE
2050 GO SUB 8000
2100 FOR F=1 TO X

2110 LPRINT T$(F)
2115 NEXT f
2120 GO TO 200
3000 REM SAVE ROUTINE
3010 CLS : PRINT AT 10,0;" INPUT
 NAME OF TEXT"
3020 INPUT S$
3030 SAVE S$ DATA T$( )
3040 GO TO 200
4000 REM LOAD TEXT ROUTINE
4010 CLS : PRINT AT 10,0;" INPUT
 NAME OF TEXT"
4020 INPUT S$
4025 PRINT "start tape"
4030 LOAD S$ DATA T$( )
4035 PRINT "STOP TAPE"
4040 GO TO 200
```

```
5000 REM EDIT ROUTINE
5001 CLS
5010 GO SUB 8000

5020 PRINT "TO EDIT LAST LINE PR
ESS 0"
5025 PRINT
5030 FOR F=1 TO X
5040 IF T$(F)="END
                 " OR T$(F)="end
                                 " THE
N GO TO 200
5050 PRINT T$(F): POKE 23692,255
5060 PAUSE 150
5070 IF LEN INKEY$=0 THEN NEXT F
: GO TO 200
5080 CLS : PRINT "PRESS KEY APPR
OIATE"
5090 PRINT : PRINT "1 CONTINUE"
5100 PRINT : PRINT "2 EDIT THIS
LINE"
5110 PRINT : PRINT "3 UP ONE LIN
E"
5120 PRINT : PRINT "4 DOWN ONE L
INE"
5125 PRINT AT 19,0;T$(F)


5130 IF INKEY$<>"" THEN GO TO 51
30
5140 IF INKEY$="" THEN GO TO 514
0
5150 IF INKEY$="1" THEN CLS : NE
XT F
5160 IF INKEY$="2" THEN GO TO 52
00
5170 IF INKEY$="3" THEN LET F=F-
1: GO TO 5125
5180 IF INKEY$="4" THEN LET F=F+
1: GO TO 5125
5190 GO TO 5130
5200 CLS : PRINT AT 5,0;"REWRITE
 THIS LINE CORRECTLY!"
5210 PRINT AT 16,0;T$(F)
5220 INPUT T$(F)
5225 CLS : PRINT "TO EDIT LAST L
INE PRESS 0": PRINT : PRINT T$(F
)
5230 NEXT F

5240 GO TO 200
6000 REM END ROUTINE
6010 NEW
8000 REM SERCH ROUTINE
8010 FOR N=1 TO 160
8020 IF T$(N)="END
                 " OR T$(N)="end
                                 " THE
N LET X=N: RETURN
8030 NEXT N
8040 RETURN
8999 GO TO 9998
9000 LET A$="BORDER"
9001 RETURN
9002 LET A$="PAPER"
9003 RETURN
9004 LET A$="INK"
9005 RETURN
9100 PRINT "THIS WORD PROCESSER
WORKS JUST  LIKE A TYPEWRITER.AT
 THE END OF EACH LINE YOU PRESS
ENTER."
9110 PRINT : PRINT : PRINT : PRI
NT :
9130 PRINT "PRESS ANY KEY TO CON
TINUE"
9140 PRINT
9150 PAUSE 0
9155 CLS
9160 RETURN
```

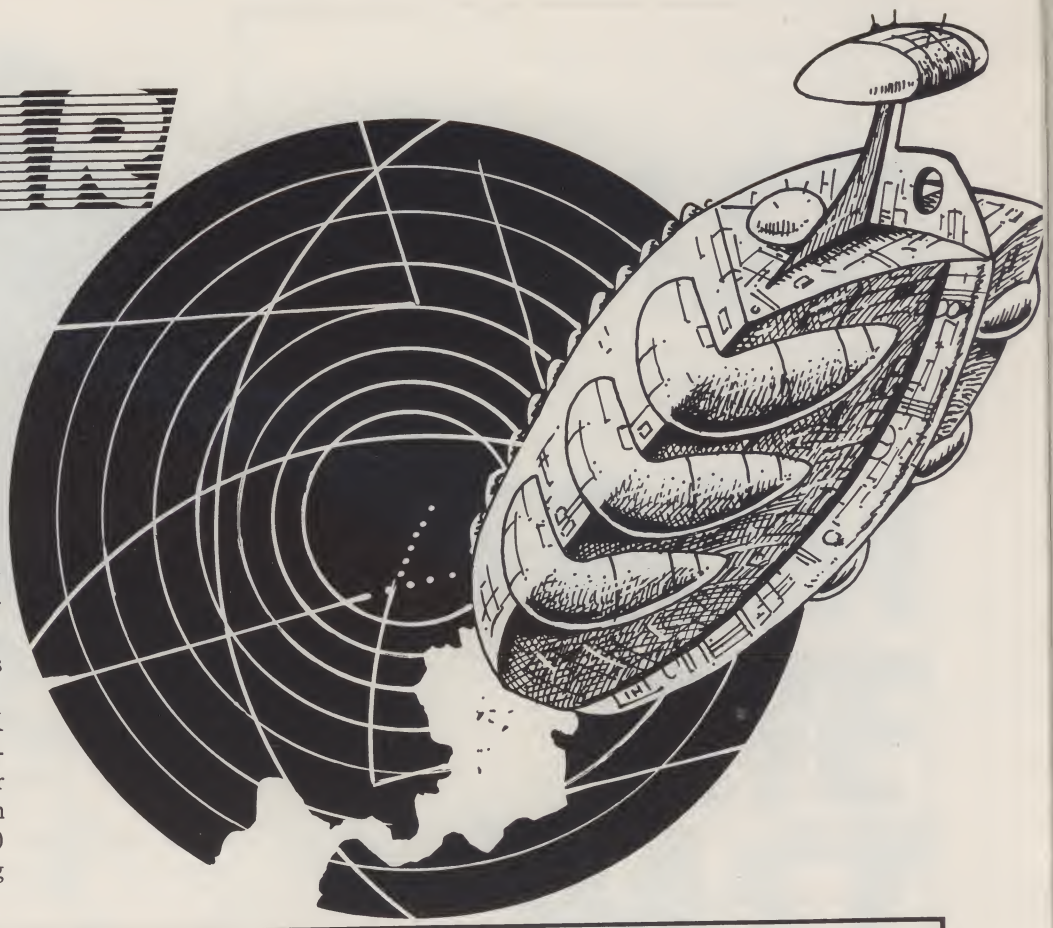
THE SCREEN displays a stretch of sea with two boats in it—one large, one small. Lurking underneath is your submarine with its torpedo ready to fire. Guide the torpedo forward with "8" and upward with "7". Once it has exploded another will appear. They will continue to appear until your time has elapsed. If you destroy the boats completely press "0" to stop the time.

Torpedo was written for the 1K ZX-81 by Robert Gill of Portsmouth, Hampshire.

TORPEDO

```
  1 REM "rn"
 10 LET A=10
 10 LET T=110
 20 LET C=INT (RND*6+5)
 30 PRINT AT 10,2;"(22*9d)";AT
10,C;"(99:96)";AT 10,C+6;"(99:96
:99:9w:96:99)";AT 19,1;"(96:9w)"
 40 LET A=1
 50 LET B=20
 60 PRINT AT 0,0;T;" ";AT B,A;"
($P:91)";AT B+1,A+1;" "
 70 IF INKEY$="7" AND A>2 THEN
LET B=B-1
 80 IF INKEY$="8" AND A<22 AND
B>10 THEN LET A=A+1
 90 IF INKEY$="0" THEN STOP
100 LET T=T-1
110 IF B=9 THEN GOTO 140
120 IF T<0 THEN GOTO 160
130 GOTO 60
140 PRINT AT 10,A;"(2*9d)"
150 GOTO 40
160 PRINT AT 19,1;"(94:95:9y)"
```

RADAR GRID

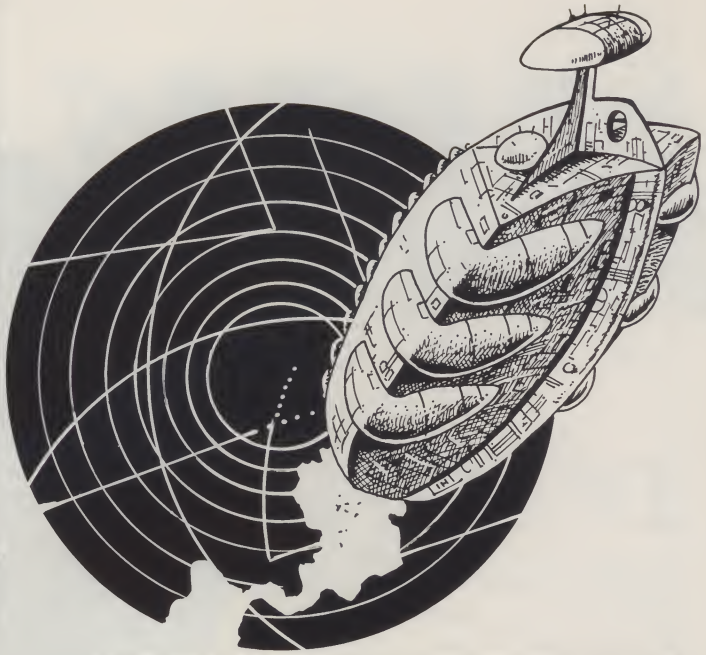


DEEP IN SPACE your radar screen detects an alien attack. To destroy an alien you must pinpoint its position on the grid by pressing the letter and then the number of the grid square in which it is situated. If you miss 10 aliens your ship is destroyed and the game ends.

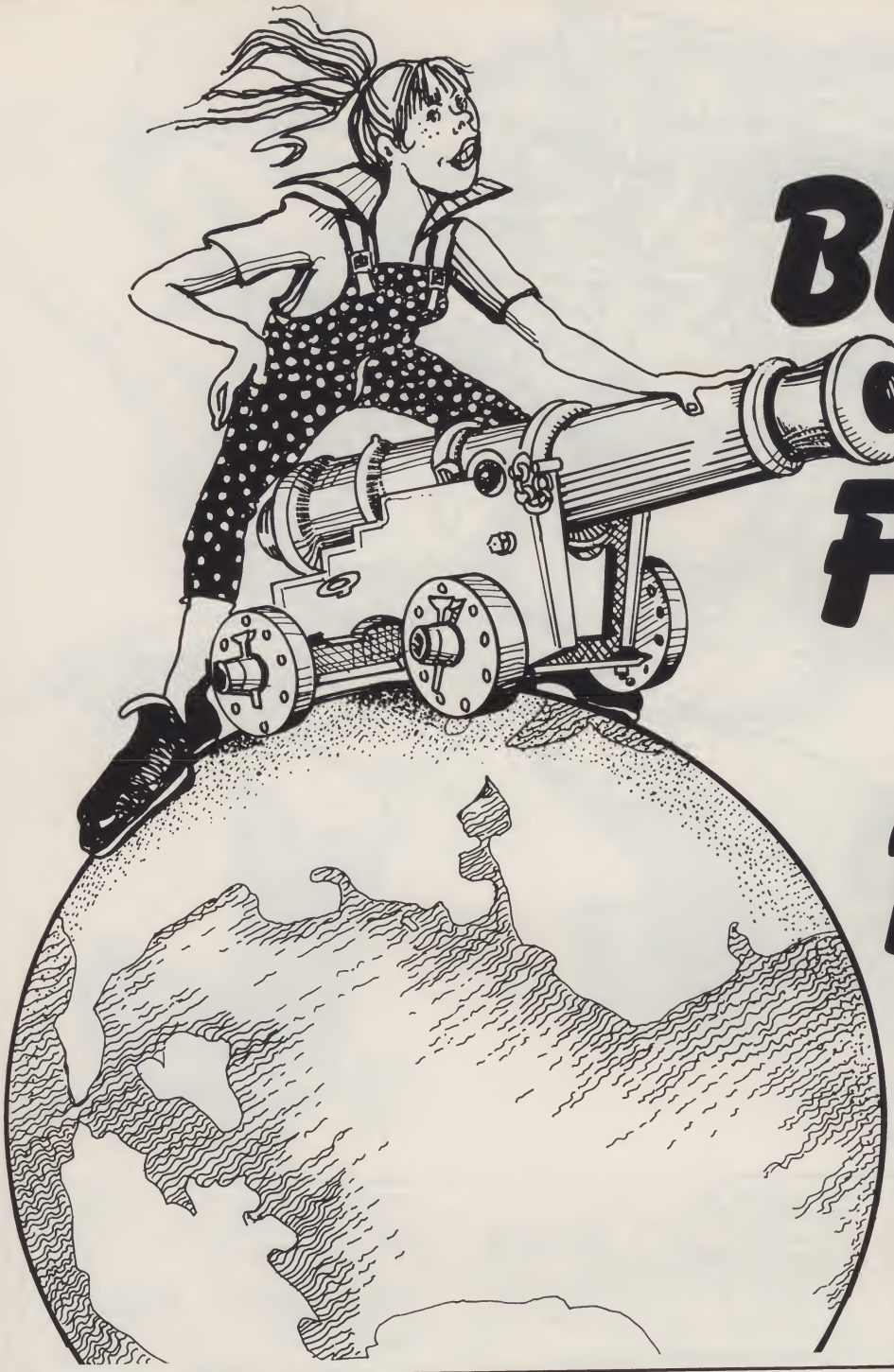
Radargrid was written for the 48K Spectrum by Bill Lythgoe of Shevington, Wigan. The length of time for which each alien remains on the screen is governed by line 240. Change the 10 to a smaller number for a faster-moving game.

```
  1 REM radargrid
 10 GO SUB 1200
 20 LET q=2
 30 BORDER 1: PAPER 1: INK 7: C
LS
 40 PRINT AT 1,15;"a"
 50 BEEP .2,7: BEEP 1,4,5
 60 PRINT '"Deep in space your
radar screen detects an alien at
tack."'"To destroy an alien you
 must pinpoint its position on t
he grid  by pressing FIRST the l
etter    THEN the number."'"You
 must do this before the nextali
en appears."'"If you miss 10 al
iens your ship is destroyed and
the game is    over."'"Press an
y key to play."
 70 PRINT AT 20,15;"b"
 75 BEEP .2,12: BEEP 1,4,10
 80 PAUSE 0
 85 CLS
 90 LET l=1: LET s=0: LET t=0
 95 FOR a=12 TO 172 STEP 16
100 PLOT 12,a: DRAW 160,0
110 NEXT a
120 FOR b=12 TO 172 STEP 16
130 PLOT b,12: DRAW 0,160
140 NEXT b
150 PRINT " "'"9"'" "'"8"'" "'"
7"'" "'"6"'" "'"5"'" "'"4"'" "'"
3"'" "'"2"'" "'"1"'" "'"0"'" "'"
 a b c d e f g h i j"
160 IF q=0 THEN LET q=2
180 BORDER q
210 LET c=(((INT (RND*10))+0.5)
*2)
220 LET d=(((INT (RND*10))+1)*2
)
230 LET f=RND*12
240 FOR x=0 TO 10
250 PRINT AT c,d;"a": BEEP .2*l
,f
255 GO SUB 1000+d
260 PRINT AT c,d;"b": BEEP .2*l
,f-2
280 NEXT x
282 LET t=t+1
283 PRINT AT 5,23;"Misses ";t
284 IF t=10 THEN GO TO 410
285 GO TO 200
300 FOR y=0 TO 10
310 PRINT AT c,d;"a": BEEP .2*l
,f
320 GO SUB 1100+c
330 PRINT AT c,d;"b": BEEP .2*l
,f-2
350 NEXT y
352 LET t=t+1
354 PRINT AT 5,23;"Misses ";t
356 IF t=10 THEN GO TO 410
360 GO TO 200
370 PRINT AT c,d;"p": FOR n=12
TO -12 STEP -1: BEEP .01,n: NEXT
```

```
 n
 375 PRINT AT c,d;" "
 376 LET s=s+1
 377 PRINT AT 3,23;"Hits ";s
 390 IF (s/10)-INT (s/10)=0 THEN
 GO TO 405
 400 GO TO 200
 405 LET l=0.7*l: LET q=q+1: GO
TO 160
 410 GO SUB 500: PRINT AT 7,22;"
To play": PRINT AT 8,22;"again":
 PRINT AT 9,22;"ENTER y": PRINT
AT 11,22;"To stop": PRINT AT 12,
22;"ENTER n": INPUT a$
 420 IF a$="y" THEN CLS   GO TO
20
 430 IF a$="n" THEN STOP
 500 FOR y=1 TO 19 STEP 2
 510 FOR x=2 TO 20 STEP 2
 520 PRINT AT y,x; INK 2+RND*5;"
a"
 530 BEEP .005,x
 540 NEXT x
 550 NEXT y
 560 RETURN
1002 IF INKEY$="a" THEN GO TO 29
0
1003 RETURN
1004 IF INKEY$="b" THEN GO TO 29
0
1005 RETURN
1006 IF INKEY$="c" THEN GO TO 29
0
1007 RETURN
1008 IF INKEY$="d" THEN GO TO 29
0
1009 RETURN
1010 IF INKEY$="e" THEN GO TO 29
0
1011 RETURN
1012 IF INKEY$="f" THEN GO TO 29
0
1013 RETURN
1014 IF INKEY$="g" THEN GO TO 29
0
1015 RETURN
1016 IF INKEY$="h" THEN GO TO 29
0
1017 RETURN
1018 IF INKEY$="i" THEN GO TO 29
0
1019 RETURN
1020 IF INKEY$="j" THEN GO TO 29
0
1021 RETURN
1101 IF INKEY$="9" THEN GO TO 37
0
1102 RETURN
1103 IF INKEY$="8" THEN GO TO 37
0
1104 RETURN
1105 IF INKEY$="7" THEN GO TO 37
```



```
0
1106 RETURN
1107 IF INKEY$="6" THEN GO TO 37
0
1108 RETURN
1109 IF INKEY$="5" THEN GO TO 37
0
1110 RETURN
1111 IF INKEY$="4" THEN GO TO 37
0
1112 RETURN
1113 IF INKEY$="3" THEN GO TO 37
0
1114 RETURN
1115 IF INKEY$="2" THEN GO TO 37
0
1116 RETURN
1117 IF INKEY$="1" THEN GO TO 37
0
1118 RETURN
1119 IF INKEY$="0" THEN GO TO 37
0
1120 RETURN
1200 FOR n=1 TO 3: READ p$
1210 FOR f=0 TO 7
1220 READ a: POKE USR p$+f,a
1230 NEXT f
1240 NEXT n
1250 DATA "a",BIN 01111110,BIN 1
1011011,BIN 11111111,BIN 1100001
1,BIN 01111111,BIN 01001001,BIN
11011011,BIN 10010010
1260 DATA "b",BIN 01111110,BIN 1
1011011,BIN 11111111,BIN 1100001
1,BIN 11111110,BIN 10010010,BIN
11011011,BIN 01001001
1270 DATA "p",BIN 10010001,BIN 0
1000010,BIN 00100100,BIN 0000000
1,BIN 10000000,BIN 00100100,BIN
01000010,BIN 10001001
1280 RETURN
```



BLAST FROM THE PAST

FOUR AGGRESSIVE spaceships appear at the top of the screen. You are charged with the defence of Earth and, for the job, have only a refurbished cannon. Press 0 to blast falling bombs and gain points. The cannonball with move only so long as you continue pressing 0. The further a bomb is from your cannon the more points you gain for hitting it.

Blast from the Past was written for the 16K ZX-81 by G Aitken of Warrington, Cheshire.

```
  1 LET HS=0
  2 CLS
 10 RAND
 14 LET C=0
 15 LET X=10
 16 LET Z=0
 20 FOR I=6 TO 20
 30 PRINT AT 21,I;"-"
 40 NEXT I
 50 PRINT AT 0,13;"(9e:1 :9r)";
AT 0,17;"(9e:1 :9r)";AT 0,21;"(9
e:1 :9r)";AT 0,25;"(9e:1 :9r)"
 60 PRINT AT 19,7;"(96:9e:97)";
AT 20,6;"(9t)0"
100 LET D=INT (RND*4)
101 LET C=C+1
103 IF Z>HS THEN LET HS=Z
104 PRINT AT 0,0;"HI-SCORE=";HS
105 PRINT AT 8,0;"SCORE=";Z
106 PRINT AT 9,0;"SHOTS=";C
107 IF C=11 THEN GOTO 3035
110 LET P=0
120 LET X=10
125 PRINT AT 18,11;"
        "
130 PRINT AT 19,11;"
        "
135 PRINT AT 20,11;"
        "
200 IF D=0 THEN GOSUB 2000
210 IF D=0 THEN GOTO 100
300 IF D=1 THEN LET P=4
305 IF D=1 THEN GOSUB 2000
310 IF D=1 THEN GOTO 100
400 IF D=2 THEN LET P=8
405 IF D=2 THEN GOSUB 2000
410 IF D=2 THEN GOTO 100
500 IF D=3 THEN LET P=12
505 IF D=3 THEN GOSUB 2000
510 GOTO 100
2000 FOR A=1 TO 20
2010 PRINT AT A,14+P;"*"
2015 PRINT AT A,14+P;" "
2020 IF INKEY$="0" THEN GOSUB 29
00
2030 IF 14+P=X-1 AND A=19 THEN P
RINT AT 18,X-2;"(9w:sp:9t)";AT 1
9,X-1;"*";AT 20,X-2;"(9t:sp:9w)"
2040 IF 14+P=X-1 AND A=19 THEN L
ET Z=Z+1+D
2490 NEXT A
2500 RETURN
3005 PRINT AT 19,X;"."
3010 PRINT AT 19,X;" "
3015 LET X=X+1
3020 IF X=31 THEN LET X=10
3030 RETURN
3035 PRINT AT 18,0;"
                    "
3037 PRINT AT 9,7;"0"
3040 PRINT AT 19,4;"YOUR 10 SHOT
S ARE OVER."
3045 PRINT AT 20,0;"
                    "
3050 PRINT AT 21,2;"DO YOU WISH
ANOTHER GO? (Y/N)"
3060 IF INKEY$="Y" THEN GOTO 2
3070 IF INKEY$<>"N" THEN GOTO 30
60
3080 STOP
4000 SAVE "SHOOt"
4010 PRINT AT 0,12;"SHOOT";TAB 1
2;"(5*97)"
4015 PRINT AT 4,3;"( USE 0 KEY T
O FIRE CANON )"
4030 PRINT AT 21,2;"PRESS NEWLIN
E TO PLAY SHOOT"
4040 INPUT A$
4050 RUN
```

```
  30 PRINT '"Two rival gangs arm
 ed with waterPistols meet up one
 night in thedesert to fight."
  40 PRINT '"The gang on my left
 are "; INK 3;"MAGENTA"
  50 PRINT '"The gang on my righ
 t are "; INK 1;"BLUE"
  60 PRINT '"Please wait whilst
 the user     defineable graphics
  are loaded"'"In good SINCLAIR t
 radition some music (?) will be
 played while  you wait."
  70 GO SUB 9000
  80 DIM a$(704)
  90 PRINT OVER 1; INK 4; PAPER
 0;AT 0,0;a$
 100 BORDER 4
 110 PRINT AT 21,2;"Press ENTER
 key TO CONTINUE "
 120 PAUSE 4e4
 140 PRINT AT 1,0; OVER 1; INK 7
 ;a$( TO 672)
 150 PRINT AT 2,0;"A MESSAGE TO
 THE "; INK 1;"BLUE"; INK 0;" GAN
 G"
 160 PRINT '"Your controls are ;
 -"
 170 PRINT '"KEY! FUNCTION"
 180 PRINT " 1 !Moves you up."
 190 PRINT " Z !Moves you down."
 200 PRINT " Q !Draw (you can't
 move now)."
 210 PRINT " W !Put gun back in
 holster (you   !can move again n
 ow)."
 220 PRINT " A !SQUIRT [fire]."
 230 PRINT AT 21,2;"Press ENTER
 key TO CONTINUE "
 240 BORDER 0
 250 PAUSE 4e4
 260 PAPER 2: INK 7: PRINT AT 0,
 0; INK 6; PAPER 2; OVER 1;a$;AT
 1,0; OVER 0;a$( TO 672)
 350 PRINT AT 2,0;"A MESSAGE TO
 THE "; INK 3;"MAGENTA"; INK 7;"
 GANG"
 360 PRINT '"Your controls are ;
 -"
 370 PRINT '"KEY! FUNCTION"
 380 PRINT " 0 !Moves you up."
 390 PRINT INK 2: PAPER 0;"SYMBO
 L SHIFT"; INK 7; PAPER 2;"!Moves
  you down."
 400 PRINT " P !Draw (you can't
 move now)."
 410 PRINT " O !Put gun back in
 holster (you   !can move again n
 ow)."
 420 PRINT " L !SQUIRT [fire]."
 430 PRINT AT 21,2;"Press ENTER
 key TO CONTINUE "
 440 PAUSE 4e4
 450 PRINT AT 1,0;a$( TO 672)
 460 BORDER 6
 500 PRINT AT 1,0;" AND SOME INS
 TRUCTIONS TO BOTH:-"
 510 PRINT '"You may press more
 than one key at a time."
 520 PRINT "You may shoot out an
 y object."
 530 PRINT "You can move off the
  screen"'"(i.e. if you move off
 the top   you reappear at the bo
 ttom)."
 540 PRINT "Only one pair of gun
 men fight atonce BUT sometimes a
  WAGGON willcome down the screen
  to try and shoot you in the leg
 s but you   will survive if you
 are behind aCACTUS."

 550 PRINT FLASH 1' BRIGHT 1'"ST
 ART THE TAPE"
 560 LOAD ""

 600 SAVE "WAIT THEN STOP TAPE"
 LINE 1
 8999 STOP

 9000 FOR j=144 TO 164: BEEP .4,-
 140+(j*1.2): FOR k=0 TO 7: BEEP

 .002,40+(k*2): READ n: POKE USR
 CHR$ j+k,n: NEXT k: NEXT j
 9020 RETURN

 9030 DATA 24,126,24,24,126,126,1
 26,126,126,126,60,60,60,60,126,2
 55,24,126,24,24,62,63,60,60,56,5
 6,24,24,24,24,28,30,0,0,0,0,222,
 208,0,0,24,126,24,24,252,252,60,
 60,28,28,24,24,24,24,56,120,0,0,
 0,0,123,11,0,0,0,0,0,0,64,97,127
 ,127,0,0,2,2,15,255,242,243,0,0,
 64,64,240,255,79,207,0,0,0,0,2,1
 30,254,254,31,48,96,64,192,128,1
 28,128,249,12,6,2,3,1,1,1,192,64
 ,64,64,64,127,127,15,3,2,2,2,2,2
 54,254,240,244,244,244,254,254,4
 ,4,4,47,47,47,127,127,32,32,32,1
 45,66,60,37,164,60,66,137,0,2,7,
 71,231,231,231,231,231,119,127,6
 2,60,60,60,60
```

SHOOT OUT

IH BALCHIN of Wallingford, Berkshire is a keen computer programmer. He reads at least eight micro magazines each month to know all the latest news about computers and his friends are shown his perfected programs so that he can benefit from their advice and opinions.

While working on **Shoot Out** for the 16K Spectrum he was trying to write a game which two players could play simultaneously, as he felt there were insufficient of them on the market.

In Shoot Out two rival gangs meet in the desert for a fight with water pistols. The blue gang moves up with 1, down with Z, draws with Q, replaces guns with W, and squirts with A. The magenta team moves up with 0, down with symbol shift, draws with P, replaces guns with O, and squirts with L.

Both gangs must avoid the cowboys who drive past in a wagon, occasionally shooting any gangster who is not safely behind a cactus.

```
   1 BORDER 0: PAPER 0: INK 9: C
LS    T                        U
  10 LET a=21: LET b=0: LET c=1:
 LET d=31                       T
  20 LET ls=0: LET rs=0    U
 100 PRINT AT 10,1;"SHOOT OUT "
 101 PRINT ' INK 1;"BLUE", INK 3
;"MAGENTA", INK 6;"1.....UP.....
...0","Q.....DRAW.....P","W..RE
PLACE GUN..O","A.....FIRE....."
; INK 7;"ENTER", INK 6;"Z.....DO
WN....."; INK 2;"SYMBOL SHIFT"
 102 FOR s=0 TO 3                T
 105 BEEP .1,0: BEEP .1,1: BEEP
.07,0: BEEP .2,-1
 106 FOR f=-40 TO 40 STEP 10: FO
R g=0 TO .9 STEP .1: BEEP .01,f+
g: NEXT g: NEXT f
 107 NEXT s    RQ
 108 BEEP 2,30: BEEP 1,35: BEEP
.5,40: BEEP .25,45: BEEP .1,50
 900 CLS : PRINT AT 21,2; PAPER
1; INK 7;" SCORE ";ls;TAB 14; PA
PER 3; INK 7;"       SCORE ";rs:
RANDOMIZE
 910 INK 4: BRIGHT 1: FOR f=3 TO
 18 STEP 3: PRINT AT f,5;"T";AT
f-1,26;"T";AT f+1,5;"U";AT f,26;
"U": NEXT f
 911 INK 8
 920 FOR f=0 TO 3: PRINT AT f*6,
14; INK 7;"mn";AT f*6+1,14; INK
2;"OP";AT f*6+2,14; INK 2;"RQ":
NEXT f
 930 BRIGHT 0
1005 LET z=145: LET x=145
1010 FOR q=20 TO 20+INT (RND*300
)
1011 LET a=a-(IN 63486=254 AND x
<>147)+(IN 65278=253 AND x<>147)
+(a<2)-(a>20)
1020 LET c=c-(IN 61438=254 AND z
<>150)+(IN 32766=253 AND z<>150)
+(c<2)-(c>20)
1022 IF IN 64510<>255 THEN LET x
=147
1023 IF IN 57342<>255 THEN LET z
=150
1024 IF IN 64510=253 THEN LET x=
145: PRINT AT a-1,1;" "
1025 IF IN 57342=253 THEN LET z=
145: PRINT AT c-1,30;" "
1026 BEEP .005,-10: BEEP .005,69
1030 IF a>=21 THEN LET a=2: PRIN
T AT 19,0;" ";AT 20,0;" "
1031 IF a<21 THEN PRINT AT a+1,0
;" "
1032 IF c<21 THEN PRINT AT c+1,3
1;" "
1035 PRINT AT 0,0;" ";AT 0,31;"
"
1040 IF c>=21 THEN LET c=2: PRIN
T AT 19,31;" ";AT 20,31;" "
1050 IF c>1 THEN PRINT AT c-2,31
;" "
1051 IF c<=1 THEN LET c=20: PRIN
T AT 1,31;" ";AT 2,31;" "
1060 IF a>1 THEN PRINT AT a-2,0;
" "
1061 IF a<=1 THEN LET a=20: PRIN
T AT 1,0;" ";AT 2,0;" "
1070 PRINT AT a,b; INK 1;CHR$ x;
AT a-1,0; INK 1;CHR$ (x-1);AT c,
d; INK 3;CHR$ z;AT c-1,d; INK 3;
CHR$ (z-1)
1080 IF x=147 THEN PRINT AT a-1,
1; INK 1;"e"
1081 IF z=150 THEN PRINT AT c-1,
30; INK 3;"h"
1090 IF IN 65022<>255 AND x=147
THEN GO SUB 9000
1100 IF IN 49150<>255 AND z=150
THEN GO SUB 3100
2000 NEXT q
2010 LET q=INT (RND*2)
2011 IF q=1 THEN LET w=c
2012 IF q=0 THEN LET w=a
2013 LET r=q*11+9
2015 FOR f=1 TO w-1
2020 PRINT AT f-1,r;"  ";AT f,r;
 INK 7;"mn";AT f+1,r; INK 2;"OP"
;AT 2+f,r; INK 2;"RQ": BEEP 0.01
,f*3
2030 NEXT f
2040 IF q=1 THEN GO TO 2500
2050 PRINT AT a,r-1; INK 3;"hf"
2060 IF ATTR (a,5)>=64 THEN GO T
O 2200
2100 INK 6: PLOT 54,171-(a*8): D
RAW -50,0: BEEP .01,39: DRAW OVE
R 1;50,0: GO TO 3300
2220 INK 6: PLOT 54,171-(a*8): D
RAW -11,0: BEEP .01,60: PRINT AT
 a,5;"S": DRAW OVER 1;11,0: PRIN
T AT a,5;" "
2225 GO SUB 6e3
2231 FOR f=w-1 TO 18
2235 PRINT AT f-1,r;"  ";AT f,r;
 INK 7;"mn";AT f+1,r-1; INK 2;"
OP ";AT 2+f,r; INK 2;"RQ": BEEP
.01,f*5
2236 NEXT f
2239 PRINT AT f-1,r;"  ";AT f,r;
"  ";AT f+1,r;"  "
```

```
2240 GO TO 1010
2500 PRINT AT c,r+1; INK 1;"ce"
2510 IF ATTR (c,26)>=64 THEN GO
TO 2600

2520 INK 6: PLOT 185,171-(c*8):
DRAW 56,0: BEEP .01,60: DRAW OVE
R 1;-56,0: GO TO 3200
2600 INK 6: PLOT 185,171-(c*8):
DRAW 26,0: BEEP .01,68: PRINT AT
 c,26;"S": DRAW OVER 1;-26,0
2610 PRINT AT c,26;" ": GO TO 22
25
3000 IF ATTR (a-1,5)>=64 THEN GO
 TO 4050
3010 IF ATTR (a-1,14)>=64 THEN G
O TO 4140
3020 IF ATTR (a-1,15)>=64 THEN G
O TO 4150
3030 IF ATTR (a-1,26)>=64 THEN G
O TO 4260
3085 INK 7: PLOT 16,179-(a*8): D
RAW 238,0: BEEP .01,60: DRAW OVE
R 1;-238,0: PLOT OVER 1;254,179-
(a*8)
3090 IF a=c OR a-1=c THEN GO SUB
 3200
3099 RETURN
3130 IF ATTR (c-1,26)>=64 THEN G
O TO 5260
3160 IF ATTR (c-1,15)>=64 THEN G
O TO 5150
3170 IF ATTR (c-1,14)>=64 THEN G
O TO 5140
3180 IF ATTR (c-1,5)>=64 THEN GO
 TO 5050
3190 PLOT 238,179-(c*8): DRAW -2
35,0: BEEP .005,40: BEEP .005,50
: DRAW OVER 1;235,0: PLOT OVER 1
;3,179-(c*8)
3195 IF c=a OR c-1=a THEN GO SUB
 3300
3199 RETURN
3200 PRINT AT c,30; INK 3;"ij";A
T c-1,30;"  "
3205 LET ls=ls+1
3215 PRINT AT 0,2; INK 5;"<--THI
S GUN-MAN WINS": FOR f=-60 TO 60
: BEEP .01,f: NEXT f
3216 IF ls=10 THEN GO TO 3600
3220 CLS : LET a=INT (RND*19)+2:
 LET c=INT (RND*19)+2: GO TO 900
3300 PRINT AT a,0; INK 1;"kl";AT
 a-1,0;"  "
3305 LET rs=rs+1
3310 IF rs=10 THEN GO TO 3500
3315 PRINT AT 0,2; INK 5;"THIS G
UN-MAN WINS-->": FOR f=-60 TO 60
: BEEP .01,f: NEXT f
3320 CLS : LET a=INT (RND*19)+2:
 LET c=INT (RND*19)+2: GO TO 900
3500 CLS : FOR f=0 TO 9: PRINT A
T f,0; INK 1;"kl": BEEP .5,0: NE
XT f
3510 FOR f=1 TO ls: PRINT AT f,3
0; INK 3;"ij": BEEP .5,0: NEXT f

3520 INK 3: FOR f=21 TO 20+10-ls
: PRINT AT 10,f;"a";AT 11,f;"b":
 BEEP 1,f*2/3: NEXT f
3530 INK 5: PRINT AT 15,2;"THE F
ASTEST SHOT---->"
3599 GO TO 7e3
3600 CLS : FOR f=0 TO 9: PRINT A
T f,30; INK 3;"ij": BEEP .5,0: N
EXT f
3610 FOR f=1 TO rs: PRINT AT f,0
; INK 1;"kl": BEEP .5,0: NEXT f
3620 INK 1: FOR f=1 TO 10-rs: PR
INT AT 10,f;"a";AT 11,f;"b": BEE
P 1,f*5: NEXT f
3630 INK 5: PRINT AT 15,2;"<----
THE FASTEST SHOT"
3700 GO TO 7e3
4050 PLOT 16,179-(a*8): DRAW 30,
0: BEEP .02,-10: DRAW OVER 1;-30
,0: PRINT AT a-1,5;"S": BEEP .00
5,0: PRINT AT a-1,5;" "
4059 RETURN
4140 PLOT 16,179-(a*8): DRAW 99,
0: BEEP .02,-10: DRAW OVER 1;-99
,0: PRINT AT a-1,14;"S": BEEP .0
05,0: PRINT AT a-1,14;" "
4149 RETURN
4150 PLOT 16,179-(a*8): DRAW 110
,0: BEEP .02,-10: DRAW OVER 1;-1
10,0: PRINT AT a-1,15;"S": BEEP
.005,0: PRINT AT a-1,15;" "
4159 RETURN
4260 PLOT 16,179-(a*8): DRAW 197
,0: BEEP .02,-10: DRAW OVER 1;-1
97,0: PRINT AT a-1,26;"S": BEEP
.005,0: PRINT AT a-1,26;" "
4269 RETURN
5050 PLOT 238,179-(c*8): DRAW -1
93,0: BEEP .02,-5: DRAW OVER 1;1
93,0: PRINT AT c-1,5;"S": BEEP .
005,5: PRINT AT c-1,5;" "
5059 RETURN
5140 PLOT 238,179-(c*8): DRAW -1
21,0: BEEP .02,-5: DRAW OVER 1;1
21,0: PRINT AT c-1,14;"S": BEEP
.005,5: PRINT AT c-1,14;" "
5149 RETURN
5150 PLOT 238,179-(c*8): DRAW -1
12,0: BEEP .02,-5: DRAW OVER 1;1
12,0: PRINT AT c-1,15;"S": BEEP
.005,5: PRINT AT c-1,15;" "
5159 RETURN
5260 PLOT 238,179-(c*8): DRAW -2
3,0: BEEP .02,-5: DRAW OVER 1;23
,0: PRINT AT c-1,26;"S": BEEP .0
05,5: PRINT AT c-1,26;" "
5269 RETURN
5999 STOP
6000 FOR v=-40 TO 60 STEP 20: FO
R s=40 TO -60 STEP -20: BEEP .01
,s: BEEP .01,v: NEXT s: NEXT v:
RETURN
7000 PRINT "AGAIN?": IF INKEY$<>
"" THEN RUN
7001 GO TO 7e3
```

ROULETTE

STARTING WITH £1,000, it is your object to make as much money as possible by betting on the roulette wheel. Various options are open to you; they are all listed at the beginning of the game. The odds vary according to the probability of the number or series of numbers on which you bet appearing at the marker.

Alterations must be made to the string of numbers listed as A$ in line 10. The first two digits should be entered as inverse numbers, the second two should be entered as shown, the third two as inverse numbers, and so on throughout the whole string, alternating white numbers on black with black numbers on white.

Roulette was written by P Williams and R Osborne for the 16K ZX-81.

```
   10 LET A$="37001123064818324450082733490215340309223741260145471621071346390430241043193140143605421235172028251629"
   30 LET W=0
   50 LET M=1000
  100 PAUSE 100
  102 PRINT AT 0,8;"
"
  105 PRINT AT 0,0;" MONEY:£";M
  110 PRINT " HIGHEST WIN:£";W
  115 IF M<1 THEN GOTO 3000
  120 PRINT "(16*9d:2*iv:14*9d)"
  125 PRINT "(32*isP)"
  130 PRINT "(32*9s)"
  140 PRINT "(sP:9e:28*97:9r:sP)"

  150 PRINT "(2*9e:28*97:2*9r)"
  160 PRINT "(2*95:4*sP)INPUT WHAT YOU WANT(5*sP:2*98)"
  170 PRINT "(2*95:28*sP:2*98)"
  180 PRINT "(2*95:6*sP)0)BET ON NUMBER(7*sP:2*98)"
  190 PRINT "(2*95:28*sP:
  200 PRINT "(2*95)1)EVEN
    2)ODD NUMBER(2*98)"
  210 PRINT "(2*95:28*sP:2*98)"
  220 PRINT "    3)BLACK          220
      4)WHITE(3*sP:2*98)"
  230 PRINT "(2*95:28*sP:2*98)"
  240 PRINT "(2*95:sP)5)EVEN-BLACK    6)ODD-BLACK(sP:2*98)"
  250 PRINT "(2*95:28*sP:2*98)"
  260 PRINT "(2*95:sP)7)EVEN-WHITE    8)ODD-WHITE(sP:2*98)"
  270 PRINT "(2*95:28*sP:2*98)"
  300 PRINT "(2*9w:28*96:2*99)"
  310 PRINT "(sP:9w:28*96:99)"
  320 INPUT B
  330 IF B=0 THEN GOSUB 1000
  340 LET V=8
  345 LET N=52
  350 PRINT AT 3,0;" HOW MUCH DO YOU WANT TO BET?"
  360 INPUT H
  370 IF H>M THEN GOTO 360
  375 LET M=M-H
  380 FOR Z=0 TO INT (RND*51)+20
  390 PRINT AT 3,0;A$( TO 32)
  400 LET A$=A$(3 TO )+A$( TO 2)
  410 NEXT Z
  420 IF CODE A$(15)>37 THEN LET
```

```
K=1
 430 IF CODE A$(15)<=37 THEN LET
 K=0
 435 IF K=1 THEN LET Y=(VAL (CHR
$ (CODE A$(15)-128))*10)+VAL (CH
R$ (CODE A$(16)-128))
 437 IF K=0 THEN LET Y=VAL A$(15
 TO 16)
 440 IF INT (Y/2)=Y/2 THEN LET E
=0
 450 IF INT (Y/2)<>Y/2 THEN LET
E=1
 460 IF B=0 THEN GOTO 600
 470 IF B=1 AND E=0 OR B=2 AND E
=1 OR B=3 AND K=1 OR B=4 AND K=0
 OR B=5 AND E=0 AND K=1 OR B=6 A
ND E=1 AND K=1 OR B=7 AND K=0 AN
D E=0 OR B=8 AND K=0 AND E=1 THE
N GOTO 2000
 480 GOTO 900
 600 IF N=Y THEN GOTO 2000
 610 IF V=2 AND Y>0 AND Y<11 OR
V=3 AND Y>10 AND Y<21 OR V=4 AND
 Y>20 AND Y<31 OR V=5 AND Y>30 A
ND Y<41 OR V=6 AND Y>40 AND Y<51
 THEN GOTO 2000
 900 PRINT AT 3,0;"
                    "
 910 PRINT AT 3,0;" YOU LOST £";
H
 920 GOTO 100
1000 FOR Z=17 TO 9 STEP -2
1010 PRINT AT Z,2;"
                    "
1020 NEXT Z
1030 PRINT AT 9,2;"1)ANY NUMBER
BETWEEN 0 TO 50"
1040 PRINT AT 11,2;"      2)1-10
  3)11-20"
1050 PRINT AT 13,2;"      4)21-30
   5)31-40"
1060 PRINT AT 15,3;"          6)4
1-50"
1070 INPUT V
1080 IF V>1 THEN GOTO 345
1090 PRINT AT 17,2;"  WHAT NUMBE
R?"
1095 INPUT N
1100 GOTO 350
2000 IF B=1 OR B=2 OR B=3 OR B=4
 THEN LET U=H*2
2010 IF B=5 OR B=6 OR B=7 OR B=8
 THEN LET U=H*5
2020 IF V>1 AND V<7 THEN LET U=H
*7
2030 IF N<51 AND N<>0 THEN LET U
=H*51
2040 IF N=0 THEN LET U=H*76
2100 IF U>W THEN LET W=U
2510 FOR Z=17 TO 7 STEP -2
2520 PRINT AT Z,2;"
                    "
2530 NEXT Z
2540 PRINT AT 7,2;"       CONGRAT
ULATIONS"
2550 PRINT AT 9,2;"      YOU HAVE
 JUST WON"
2560 PRINT AT 11,2;"          £";
U
2570 LET M=M+U
2600 GOTO 100
3000 FOR Z=17 TO 7 STEP -2
3010 PRINT AT Z,2;"
                    "
3020 NEXT Z
3030 PRINT AT 7,2;"             SO
RRY"
3040 PRINT AT 9,2;"YOU HAVE LOST
 ALL YOUR MONEY"
3050 PRINT AT 11,2;"   THE CASIN
O DOES NOT "
3060 PRINT AT 13,2;"          LEN
D MONEY"
3070 PRINT AT 15,2;"         ANOT
HER GAME ?"
3080 IF INKEY$="" THEN GOTO 3080
3090 IF INKEY$="N" THEN STOP
3100 PRINT AT 17,2;"  DO YOU WAN
T TO RESET THE "
3110 PRINT AT 18,2;"       HIGHES
T WINNINGS ?"
3120 INPUT B$
3130 IF A$="Y" THEN RUN
3140 GOTO 50
7000 SAVE " ROULETTE "
7010 RUN
```

KLONG

JUMP OVER the barrels rolling towards you by using key 0. When you clear a barrel you score points. Moving right with key 8 gives a higher score when you jump. You have only 20 leaps before the end of the game. **Klong** was written for the 16K ZX-81 by W Lewis of Girton, Cambridge.

```
T  10 LET J=20
   20 LET SC=0
   30 LET A$="
  "
   40 LET X=8
   50 LET A=INT (RND*2)
   60 LET A$=A$(3 TO )+" "+CHR$ (
A*CODE "0")
   70 PRINT AT 0,0;"SCORE ";SC;"
      JUMPS ";J;" ";AT 10,6;A$;TA
B 6;"(20*isP)";AT 9,X;" "
   80 LET M$=INKEY$
   90 LET X=X+2*((INKEY$="8" AND
X<24)-(INKEY$="5" AND X>6))
  100 PRINT AT 10-(M$="0"),X;"T"
  110 IF M$="0" THEN LET J=J-1
  120 IF J=0 OR (M$<>"0" AND A$(X
-4)="0") THEN STOP
  130 IF M$="0" AND A$(X-4)="0" T
HEN LET SC=SC+5*(X-4)
  140 GOTO 50
```

DEER HUNT

YOUR TASK is to shoot as many deer as possible to relieve the famine from which your tribe is suffering. You are stationed beside a large tree where you have a clear view of a herd of migrating antelope. You must shoot as many as possible, using capital F, with the 25 shots allowed. A startled giraffe watches from among the surrounding bush. The resulting score and number of shots remaining is shown at the bottom of the screen.

Deer Hunt was written for the 16K Spectrum by W Simister of Haverfordwest, Dyfed.

```
  20 BORDER 3: PAPER 6: CLS
 100 REM TREES & BUSHES (T,B,P&Q
IN GRAPHIC
 110 FOR R=0 TO 7: READ A
 120 POKE USR "T"+R,A: INK 4: NE
XT R
 130 DATA 60,255,255,126,24,24,2
4,0
 140 FOR S=0 TO 7: READ C
 150 POKE USR "B"+S,C: INK 4: NE
XT S
 160 DATA 0,0,0,60,126,255,126,0
 170 FOR U=0 TO 7: READ D
 180 POKE USR "P"+U,D: INK 4: NE
XT U
 190 DATA 63,255,255,63,7,1,1,1
 200 FOR V=0 TO 7: READ G
 210 POKE USR "Q"+V,G: INK 4: NE
XT V
 220 DATA 252,255,255,252,224,12
6,128,128
 300 PRINT AT 0,0;"TT  T TB PQ T
TPQ T T BT T BPQTB"
 310 PRINT AT 1,0;"  TTBT  T  T
B TT T T  B T T T"
 320 PRINT AT 2,0;"T T T  PQ T
T  T T B  T  BB  BB"
 330 PRINT AT 3,0;"T  T T T B T
BTB T  PQBB B  B"
 340 PRINT AT 6,0;" TT T T TB PQ
 B   B  BB  PQBBB"
 350 PRINT AT 8,0;"PQ T TBPQT B
     BPQ B  BB  B"
 360 PRINT AT 9,0;"T  T T T TB
    B B BB  B  B B"
 370 PRINT AT 10,0;"T T  T B T T
      B B  B BB BB B"
 380 PRINT AT 11,0;" T TB T TB
    B  B BB BPQBBB"
 390 PRINT AT 12,0;"T  PQTB B B
    BB B  B BB  B B"
 400 PRINT AT 13,0;"T T B T   BB
 B     B  B    B  B"
 410 PRINT AT 14,0;" B T B  BB
B  B  B  B  B B B  B"
 420 PRINT AT 15,0;"T B B  BBB
        B  B   B  B"
 430 PRINT AT 16,0;" B   B  T  P
Q      BPQT B     B"
 440 PRINT AT 17,0;" PQB   BPQB
        B   PQB B  B PQ"
 450 PRINT AT 18,0;"BB PQB  T  B
      B  PQB   B"
 460 PRINT AT 19,0;" PQB  B  B
T     PQTB   BPQ B"
 470 PRINT AT 20,0;" B PQB PQ BP
Q BPQ  B PQBB  BPQ B"
 500 REM LARGE TREE
 510 PLOT 130,48: DRAW 6,0: PLOT
 128,47: DRAW 10,0: INK 3
 520 PLOT 125,46: DRAW 16,0: PLO
T 123,45: DRAW 20,0: INK 3
 530 PLOT 122,44: DRAW 22,0: PLO
```

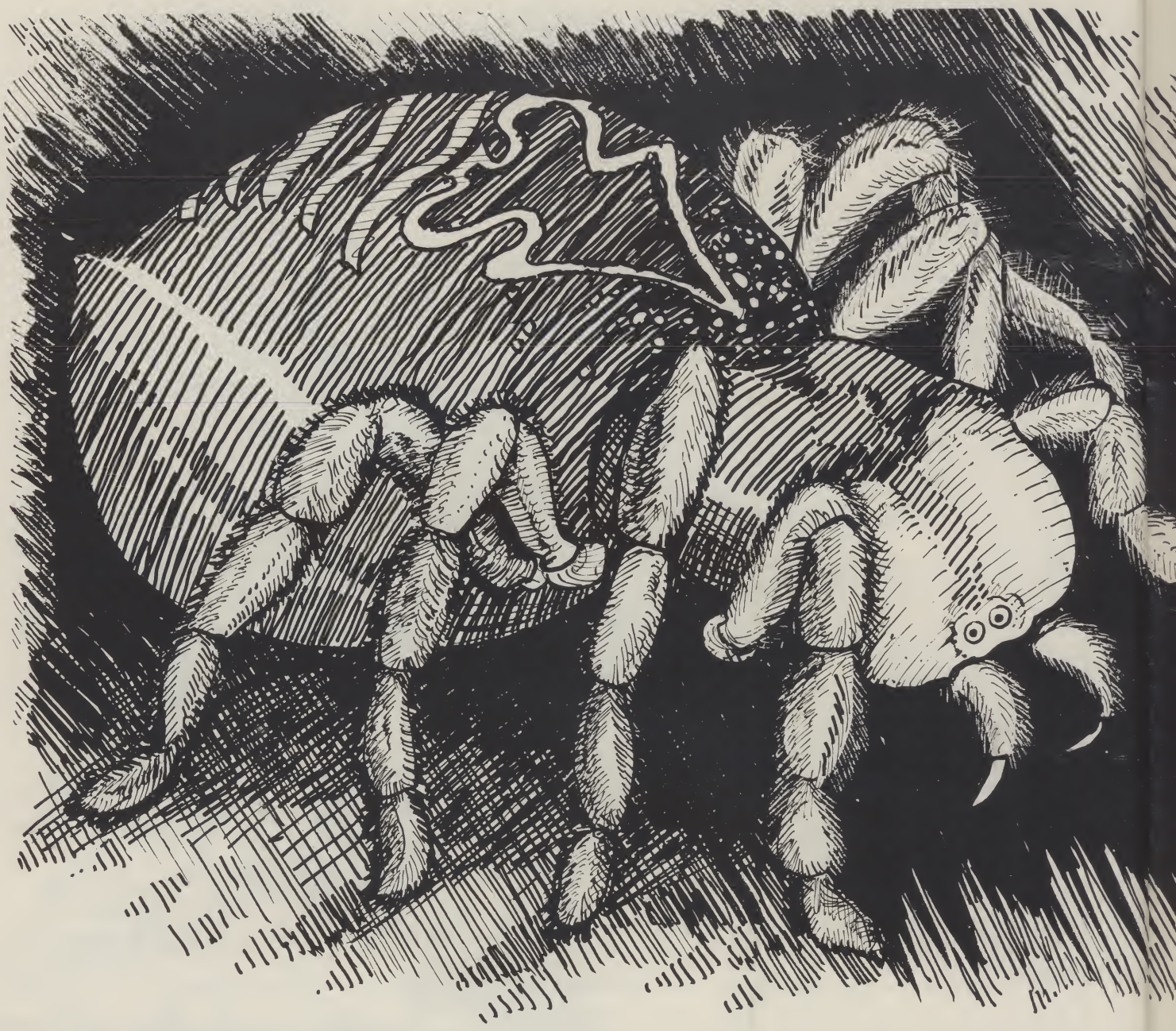
```
T 121,43: DRAW 23,0: INK 3
 540 PLOT 120,42: DRAW 24,0: PLO
T 119,41: DRAW 26,0: INK 3
 550 PLOT 120,40: DRAW 24,0: PLO
T 120,39: DRAW 24,0: INK 3
 560 PLOT 121,38: DRAW 24,0: PLO
T 121,37: DRAW 24,0: INK 3
 570 PLOT 122,36: DRAW 23,0: PLO
T 123,35: DRAW 21,0: INK 3
 580 PLOT 124,34: DRAW 19,0: PLO
T 126,33: DRAW 16,0: INK 3
 590 PLOT 127,32: DRAW 10,0: PLO
T 128,31: DRAW 9,0: INK 3
 600 PLOT 129,30: DRAW 6,0: PLOT
 130,29: DRAW 4,0: INK 3
 610 PLOT 130,28: DRAW 4,0: PLOT
 130,27: DRAW 4,0: INK 3
 620 PLOT 130,26: DRAW 4,0: PLOT
 130,25: DRAW 4,0: INK 3
 630 PLOT 130,24: DRAW 4,0: PLOT
 130,23: DRAW 4,0: INK 3
 640 PLOT 130,22: DRAW 4,0: PLOT
 130,21: DRAW 4,0: INK 3
 650 PLOT 130,20: DRAW 4,0: PLOT
 129,19: DRAW 6,0: INK 3
 660 PLOT 129,18: DRAW 8,0: INK
3
 700 REM GIRAFFE (R & S IN GRAPH
IC)
 710 FOR X=0 TO 7: READ Y
 720 POKE USR "R"+X,Y: NEXT X
 730 DATA 16,112,240,176,48,48,4
8,56
 740 FOR M=0 TO 7: READ N
 750 POKE USR "S"+M,N: NEXT M
 760 DATA 56,62,63,51,51,51,99,9
9
 780 PRINT AT 9,24; INK 1;"R": P
RINT AT 10,24; INK 1;"S"
 800 REM DEER (E IN GRAPHIC)
 810 FOR S=0 TO 7: READ B
 820 POKE USR "E"+S,B: INK 1: NE
XT S
 830 DATA 16,32,64,224,127,63,50
,83
 900 REM MAN SHOOTING (M & N IN
GRAPHIC)
 910 FOR L=0 TO 7: READ F
 920 POKE USR "M"+L,F: NEXT L
 930 DATA 4,4,28,36,70,93,93,42
 940 FOR P=0 TO 7: READ Q
 950 POKE USR "N"+P,Q: INK 2: NE
XT P
 960 DATA 28,28,28,28,20,34,34,3
4
 970 PRINT AT 17,14; INK 2;"M":
PRINT AT 18,14; INK 2;"N"
1000 LET SCORE=0
1010 FOR G=1 TO 20: BEEP .008,G:
 NEXT G
1020 LET SHOTS=25
1030 FOR H=50 TO 20 STEP -2: BEE
P .008,H: NEXT H
1040 LET C$="EE  E E   EEE   EE
 E  EEE   E  "
1050 LET D$=C$
1060 LET ACROSS=15
1070 LET DOWN=17+18
1080 PRINT AT 7,0;C$;AT 5,0;D$;A
T 4,0;D$(3 TO  )+D$(1 TO 2): BEE
P .008,55-SHOTS
1090 FOR X=16 TO 8 STEP -1
1100 IF INKEY$="F" THEN PRINT AT
 X,14;"↑"
1110 PRINT AT X,14;" ": NEXT X
1120 IF INKEY$="F" THEN LET SHOT
S=SHOTS-1: BEEP .05,SHOTS: IF C$
(ACROSS)<>"  " THEN LET SCORE=SC
ORE+57: BEEP .05,50-SHOTS: LET C
$(ACROSS)="  "
1130 IF INKEY$="F" THEN BEEP .05
,SHOTS: IF D$(ACROSS)<>" " THEN
LET SCORE=SCORE+517: BEEP .05,50
-SHOTS: LET D$(ACROSS)="  "
1140 PRINT AT 21,0; INVERSE 1;"S
CORE: "; FLASH 1;SCORE; FLASH 0;
"SHOTS LEFT: "; FLASH 1;SHOTS; F
LASH 0;"  "
1150 IF SHOTS<1 THEN PRINT AT 10
,0;"  THAT'S THE END OF THE GAME
": STOP
1160 LET C$=C$(2 TO  )+C$(1)
1170 LET D$=D$(3 TO  )+C$(1 TO 2
)
1180 GO TO 1080
```

```
    2 GOTO 9000
   3 PRINT AT 10,0;"maximum >";A
T 10,21;"< maximum";AT 11,1;"fir
ing";AT 11,23;"firing";AT 12,2;"
range";AT 12,23;"range"
   4 FOR A=0 TO 21
   5 PRINT AT A,9;"(            )"
   6 NEXT A
   7 LET S=0
   8 LET BU=50
   9 LET B1=10
  10 DIM A(10)
  20 FOR B=1 TO 10
  30 LET A(B)=21
  40 PRINT AT A(B),B+9;CHR$ ((RN
D*9)+1)
  50 NEXT B
  60 FOR B=1 TO 10
  70 LET A(B)=A(B)-INT (RND*2)
  80 PRINT AT A(B),B+9;CHR$ ((RN
D*9)+1)
 100 PRINT AT 0,B1;" "
 110 LET B1=B1+(INKEY$="8" AND B
1<19)-(INKEY$="5" AND B1>10)
 120 PRINT AT 0,B1;"(1=)"
 130 IF BU>0 AND CODE INKEY$>37
AND CODE INKEY$<64 THEN GOTO 500
 135 LET S=S+1
 137 IF A(B)=0 THEN GOTO 600
 140 NEXT B
 150 GOTO 60
 500 FOR C=1 TO INT (RND*11)
 510 PRINT AT C,B1;".";AT C,B1;"
 "
 520 NEXT C
 521 IF C>A(B1-9) THEN LET A(B1-
9)=C
 523 LET BU=BU-1
 530 IF BU>0 THEN GOTO 140
 550 FOR Z=0 TO 21 STEP 2
 560 PRINT AT Z,0;"NO MORE  ";AT
 Z,21;"  NO MORE";AT Z+1,0;"BULL
ETS  ";AT Z+1,21;"  BULLETS"
 570 NEXT Z
 580 GOTO 140
 600 LET A$=STR$ S
 601 FOR A=1 TO LEN A$
 602 LET B=CODE A$(A)
 603 LET B=B+120
 604 LET A$(A)=CHR$ B
 606 NEXT A
 608 CLS
 610 FOR A=0 TO 21 STEP 2
 620 PRINT AT A,A;"score";A$;TA
B A+1;"PLAY AGAIN?"
 630 NEXT A
 640 IF INKEY$="N" THEN GOTO 700
 650 IF INKEY$="Y" THEN GOTO 900
0
 660 GOTO 640
 700 CLS
 710 FOR A=0 TO 19 STEP 2
 720 PRINT AT A,A;"anyone else";
TAB A+1;"want to play"
 730 NEXT A
 740 IF INKEY$="Y" THEN GOTO 900
 750 IF INKEY$="N" THEN STOP
 760 GOTO 740
9000 CLS
9005 PRINT TAB 12;"rubbish";TAB
0;"THE RUBBISH IS GETTING HIGHER
   AND THE ONLY WAY TO STOP IT I
S  TO SHOOT AT IT.";TAB 0;"YOU O
NLY HAVE 50 BULLETS.SO USE THEM
WISELY,THE BULLETS HAVE A  CERTA
IN FIRING RANGE WHICH IS   SHOWN
 WHEN RUN."
9010 PRINT "TO MOVE LEFT YOU USE
 KEY <5>.   TO MOVE RIGHT YOU US
E KEY <8>.  TO FIRE YOU USE ANY
LETTER KEY."
9020 PRINT TAB 0;TAB 0;TAB 0;"PR
ESS ANY KEY (EXCEPT BREAK OR  SH
IFT TO PLAY.enjoy your game"
9995 IF INKEY$="" THEN GOTO 9995
9996 CLS
9997 GOTO 3
9998 SAVE "RUBBISH"
9999 RUN
```

RUBBISH

YOUR PLAYING space is fast filling with **Rubbish** and David Seguss of Plumstead, London has decreed that the only way you can get rid of the rubbish is by shooting it. Move left and right with keys "5" and "8". Fire with any letter key but remember to wait until the rubbish is in range.

The game ends when you run out of bullets and are overwhelmed with rubbish (16K ZX-81).



```
   2 REM USR GRAPHICS - A=MAN B=
SPIDER C=SPIDERS THREADS D=2 LIN
ES E,F,G,H=SPIDERS WEB
   7 REM
   8 REM
   9 REM USR GRAPHICS SECTION
  10 RESTORE
  20 FOR z=144 TO 154: FOR x=0 T
O 7: READ f: POKE USR CHR$ z+x,f
: NEXT x: NEXT z
  30 DATA 24,24,60,90,24,36,36,6
6
  40 DATA 16,56,84,124,170,170,1
70,40
  50 DATA 16,16,16,16,16,16,16,1
6
  60 DATA 73,73,73,73,73,73,73,7
3
  70 DATA 128,64,96,24,3,0,0,0
  80 DATA 0,0,0,0,0,192,48,15
  90 DATA 0,0,0,0,0,3,12,240
 100 DATA 1,2,12,48,192,0,0,0
 110 DATA 17,18,20,24,16,16,16,1
6
 120 DATA 145,82,52,24,16,16,16,
16
 130 DATA 144,80,48,16,16,16,16,
16
 990 REM INITIALISATION
1000 BORDER 3: INK 0: PAPER 7: C
LS
1010 PRINT AT 10,0;" DO YOU REQU
IRE INSTRUCTIONS?"
1020 INPUT i$
1030 IF i$="y" THEN GO SUB 9000
1040 IF i$="yes" THEN GO SUB 900
0
1044 IF i$="Y" THEN GO SUB 9000
1045 IF i$="YES" THEN GO SUB 900
0
1050>LET cnv=134: LET bb=0: LET
bc=1: LET bcc=0: LET w=0: LET a=
18: LET b=1: LET s1=12: LET s4=1
2: LET s2=16: LET s3=16: LET v=9
: LET sc=0: LET tm=0: LET tc=1:
LET r1=1: LET r4=-1: LET r2=-1:
LET r3=1: LET li=3
1060 CLS
1070 PRINT AT 0,0; INK 2;"      b
   TARANTULA    b"
1080 PRINT AT 2,0; INK 5;"Lives
left- ",li,"score- ",sc
1090 PRINT AT v-2,0; INK 1;"(31*
isP)"
1100 PRINT AT 19,0; INK 1;"(196:
30*isP:196)"
1110 PRINT AT a,b; INK 0;"a"
1120 FOR x=18 TO 14 STEP -1: PRI
NT AT x,0; INK 2;"(196)": NEXT x
1130 FOR x=8 TO s1-1: PRINT AT x
,8; INK 0;"c": NEXT x: PRINT AT
s1,8; INK 2;"b"
1140 FOR x=8 TO s2-1: PRINT AT x
,13; INK 0;"c": NEXT x: PRINT AT
 s2,13; INK 2;"b"
1150 FOR x=8 TO s3-1: PRINT AT x
,18; INK 0;"c": NEXT x: PRINT AT
 s3,18; INK 2;"b"
1160 FOR x=8 TO s4-1: PRINT AT x
,23; INK 0;"c": NEXT x: PRINT AT
 s4,23; INK 2;"b"
1170 FOR x=1 TO 26: BEEP .08,x:
NEXT x
1171 DEF FN o()=INT ((PEEK 23672
+256*PEEK 23673+65536*PEEK 23674
)/50)
1172 DEF FN p(x,y)=(x+y+ABS (x-y
))/2
1173 DEF FN n()=FN p(FN o(),FN o
())
1180 FOR h=23674 TO 23672 STEP -
1: POKE h,0: NEXT h
1990 REM MOVEMENT LOOP
2000 PRINT AT a,b; INK 0;"a"
2010 LET bb=bb+(INKEY$="8")-(INK
EY$="5")
2015 IF bb=-3 THEN LET bb=-2
2016 IF bb=3 THEN LET bb=2
2017 LET bcc=bcc+1: IF bcc>10 TH
EN LET bcc=0: LET bc=r1
2022 PRINT AT 19,0;CHR$ cnv
2024 PRINT AT 19,31;CHR$ cnv
2026 IF cnv=134 THEN GO TO 2028
```

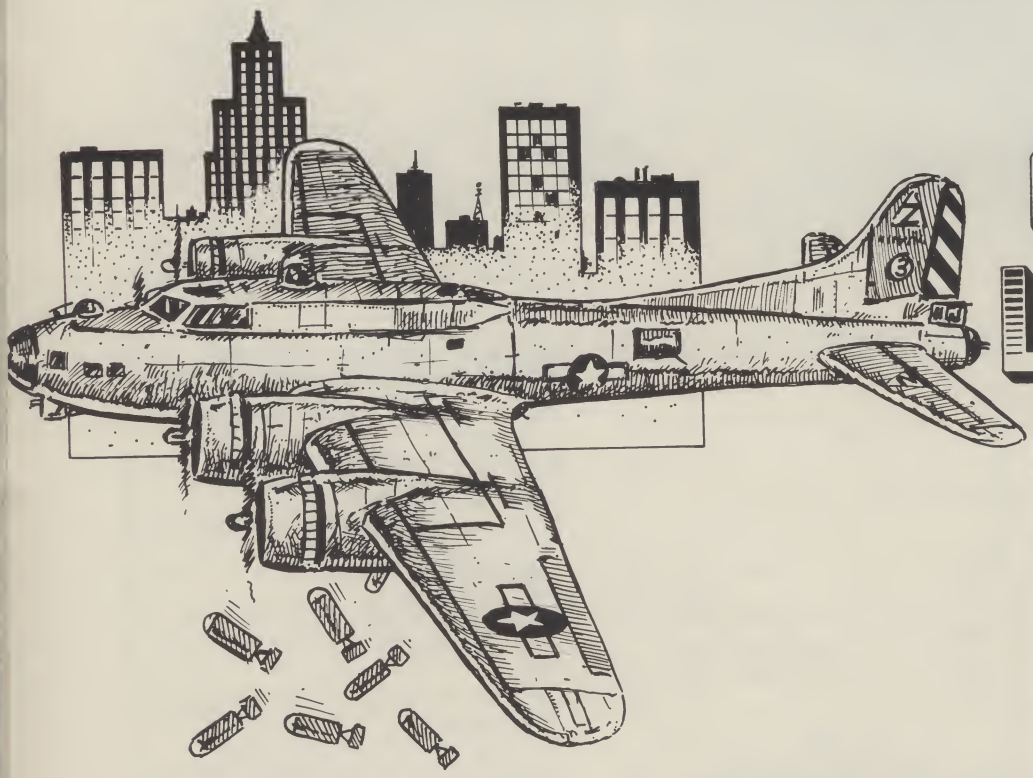
TARANTULA

YOUR TASK is to carry all the treasure chests through the spiders' lair. You must be watchful because the spiders will soon start spinning their webs to catch you. Also the direction of movement of the conveyor belt on which you stand changes constantly, making quick evasion of the spiders difficult.

Tarantula was written for the 16K Spectrum by J Harvey of Warley, West Midlands.

```
2027 LET cnv=134: GO TO 2030
2028 LET cnv=137
2030 PRINT AT 2,0; INK 5;"Lives
left- ",li,"Score- ",sc
2040 PRINT AT s1,8; INK 0;"c": I
F s1=v OR s1<v THEN LET r1=1
2041 IF s1=18 THEN LET r1=-1
2042 IF r1=-1 THEN PRINT AT s1,8
;" "
2043 LET s1=s1+r1: PRINT AT s1,8
; INK 2;"b"
2050 PRINT AT s2,13; INK 0;"c":
IF s2=v OR s2<v THEN LET r2=1
2051 IF s2=18 THEN LET r2=-1
2052 IF r2=-1 THEN PRINT AT s2,1
3;" "
2053 LET s2=s2+r2: PRINT AT s2,1
3; INK 2;"b"
2060 PRINT AT s3,18; INK 0;"c":
IF s3=v OR s3<v THEN LET r3=1
2061 IF s3=18 THEN LET r3=-1
2062 IF r3=-1 THEN PRINT AT s3,1
8;" "
2063 LET s3=s3+r3: PRINT AT s3,1
8; INK 2;"b"
2070 PRINT AT s4,23; INK 0;"c":
IF s4=v OR s4<v THEN LET r4=1
2071 IF s4=18 THEN LET r4=-1

2072 IF r4=-1 THEN PRINT AT s4,2
3;" "
2073 LET s4=s4+r4: PRINT AT s4,2
3; INK 2;"b"
2081 LET w=w+1
2082 IF w=50 THEN GO TO 2084
2083 GO TO 2090
2084 PRINT AT v-1,8; INK 0;"iefø
hjeføhjeføhk"
2085 LET w=0: LET v=v+1
2090 IF b=8 AND s1=18 THEN GO TO
 6000
2100 IF b=13 AND s2=18 THEN GO T
O 6100
2110 IF b=18 AND s3=18 THEN GO T
O 6200
2115 IF v=19 THEN GO TO 8000
2120 IF b=23 AND s4=18 THEN GO T
O 6300
2121 PRINT AT a,b;" "
2131 LET b=b+bb+bc
2132 IF b<1 THEN LET b=1
2133 IF b>30 THEN LET b=30
2134 IF b=30 AND tc=1 THEN GO TO
 2240
2220 IF b=1 THEN LET tc=1
2230 GO TO 2000
2240 LET tc=0: LET tm=tm+1: LET
sc=sc+10: PRINT AT 19-tm,31; INK
 2;"(96)";AT 13+tm,0;" ": IF tm=
5 THEN GO TO 6400
2250 GO TO 2000
2260 REM END OF MOVEMENT LOOP
5990 REM MAN CAUGHT ROUTINE
6000 PRINT AT a,b; OVER 1; INK 6
;"d"
6010 LET li=li-1: IF li=0 THEN G
O TO 8000
6020 LET TC=1
6030 FOR x=1 TO 15: BEEP .006,x:
 NEXT x
6040 LET a=18: LET b=1: PRINT AT
 s1,8; INK 2;"b"
6050 FOR x=1 TO 15: NEXT x: PRIN
T AT a,b; INK 0;"a"
6060 FOR x=1 TO 10: NEXT x
6070 GO TO 2000
6100 PRINT AT a,b; OVER 1; INK 6
;"d"
6110 LET li=li-1: IF li=0 THEN G
O TO 8000
6120 IF tc=1 THEN LET tc=0
6130 FOR x=1 TO 15: BEEP .006,x:
 NEXT x
6140 LET a=18: LET b=1: PRINT AT
 s2,13; INK 2;"b"
6150 FOR x=1 TO 15: NEXT x: PRIN
T AT a,b; INK 0;"a"
6160 FOR x=1 TO 10: NEXT x
6170 GO TO 2000
6200 PRINT AT a,b; OVER 1; INK 6
;"d"
6210 LET li=li-1: IF li=0 THEN G
O TO 8000
```

```
6220 IF tc=1 THEN LET tc=0
6230 FOR x=1 TO 15: BEEP .006,x:
 NEXT x
6240 LET a=18: LET b=1: PRINT AT
 a3,18; INK 2;"b"
6250 FOR x=1 TO 15: NEXT x: PRIN
T AT a,b; INK 0;"a"
6260 FOR x=1 TO 10: NEXT x
6270 GO TO 2000
6300 PRINT AT a,b; OVER 1; INK 6
;"d"
6310 LET li=li-1: IF li=0 THEN G
O TO 8000
6320 IF tc=1 THEN LET tc=0
6330 FOR x=1 TO 15: BEEP .006,x:
 NEXT x
6340 LET a=18: LET b=1: PRINT AT
 a4,23; INK 2;"b"
6350 FOR x=1 TO 15: NEXT x: PRIN
T AT a,b; INK 0;"a"

6360 FOR x=1 TO 10: NEXT x
6370 GO TO 2000
6390 REM TREASURE AT OTHER SIDE
ROUTINE
6400 LET tm=0: LET tc=0
6420 FOR x=18 TO 14 STEP -1: PRI
NT AT x,0; INK 2;"(96)";AT x,31;
" ": BEEP .009,x: NEXT x
6430 GO TO 2000
7990 REM SORE BOARD
8000 FOR x=1 TO 5: NEXT x
8001 FOR x=1 TO 15: BEEP .006,x:
 NEXT x
8010 CLS
8020 PRINT AT 10,0;" YOU SCORED-
";sc;" AND YOU TOOK ";FN m( );"
  SECONDS
  do you want to try again?"
8025 FOR x=-12 TO 40 STEP 6: BEE
P .08,x: NEXT x

8030 INPUT i$
8040 IF i$="y" THEN GO TO 1050
8050 IF i$="yes" THEN GO TO 1050
8060 CLS
8070 FOR x=40 TO -40 STEP -5: BE
EP .06,x: NEXT x
8080 STOP
8990 REM INSTRUCTIONS
9000 CLS
9010 PRINT AT 0,8;"b  TARATULA
b"
9020 PRINT
9030 PRINT " YOUR TASK IS TO CAR
RY ALL YOUR"
9040 PRINT " TREASURE CHESTS THR
OUGH THE"
9050 PRINT  " SPIDERS LAIR. BUT
BEWARE!!"
9060 PRINT " THE SPIDERS WILL SO
ON START"

9070 PRINT " SPINING WEBS ACROSS
 THE ROOF"
9075 PRINT " MAKING THER TASK OF
 CATCHING"
9076 PRINT " YOU EASIER"
9077 PRINT " THE DIRECTION OF TH
E CONVEYOR   CONVEYOR BELT ON WH
ICH YOU      STAND IS CONSTANTLY
 CHANGING"
9080 PRINT
9090 PRINT " USE KEYS 5 AND 8 TO
 MOVE"
9100 PRINT
9110 PRINT " PRESS ANY KEY TO ST
ART"
9115 PAUSE 50
9120 LET I$=INKEY$: IF I$="" THE
N GO TO 9120
9130 RETURN
```

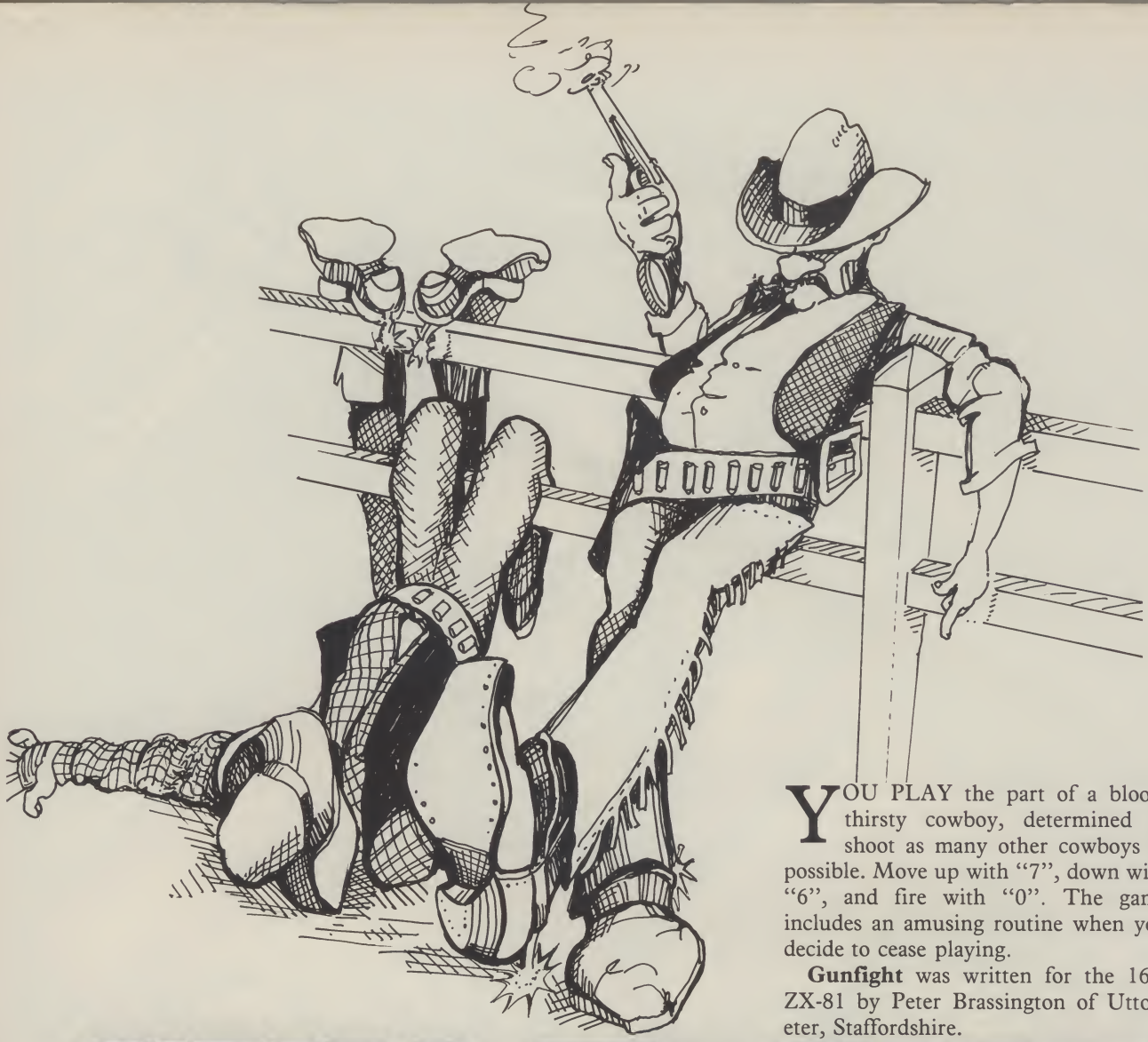


CITY LANDER

```
  1 LET V=VAL "21"
  2 LET M=NOT V
  3 LET T=V
 10 FOR X=PI*PI TO T+T
 20 FOR Y=NOT PI  TO RND*RND*T
 30 PLOT X,Y
 40 NEXT Y
 50 NEXT X
100 FOR Y=VAL "10" TO T
110 FOR X=NOT PI TO VAL "20"
120 IF V=T THEN LET M=CODE INKE
Y$
130 IF M THEN GOSUB VAL "500"
150 PRINT AT Y,X;" O>>"
160 IF VAL "ABS (PEEK (PEEK 163
96+16405+X+25*Y)-59)<>59" THEN S
TOP
200 NEXT X
210 PRINT AT Y,X;"   "
250 NEXT Y
260 STOP
510 IF V=T THEN LET U=X+SGN PI
512 IF V=T THEN LET V=Y
515 PRINT AT V,U;" "
520 LET V=V+SGN PI
525 IF V=T THEN LET M=NOT PI
530 PRINT AT V,U;"*"
540 RETURN
```

THIS POPULAR game has been included in *Sinclair Programs* previously but this version has been included because all its features have been contained cleverly in a very short program by R Entwistle of Cheltenham.

You are the pilot of a bomber which has to make a landing over a city of skyscrapers. The bomber loses height constantly and so must avoid hitting skyscrapers by dropping bombs. Any key drops a bomb provided that the previous bomb has landed. POKE 16389,76 before RUNning this game (16K ZX-81).



YOU PLAY the part of a bloodthirsty cowboy, determined to shoot as many other cowboys as possible. Move up with "7", down with "6", and fire with "0". The game includes an amusing routine when you decide to cease playing.

Gunfight was written for the 16K ZX-81 by Peter Brassington of Uttoxeter, Staffordshire.

GUN FIGHT

```
   5 REM "GUNFIGHT"
  10 PRINT AT 0,0;"                    g
unfight
                          THE OBJECT
OF THIS GAME IS TO KILL AS MANY
MEN AS POSSIBLE    BEFORE THEY C
AN KILL YOU"
  11 PRINT "YOU ARE THE COWBOY O
N THE RIGHT AND YOU USE THE CONT
RULS;"
  12 PRINT AT 10,0;"
7=UP"
  13 PRINT "                6=DOWN"
  14 PRINT "                0=FIRE"
  15 PRINT AT 17,0;"          Pres
s newline"
  16 INPUT A$
  17 INPUT A$
  19 IF A$<>"" THEN GOTO 20
  20 CLS
  25 LET Q=0
  30 LET A=12
  35 LET X=8
  40 PRINT AT X-1,0;"    ";AT X+4
,0;"    ";AT X,0;"(93:99:94)";AT
 X+1,0;"(sp:9e)>";AT X+2,1;"(9f:
2*sp)";AT X+3,1;"(9w)"
  50 IF X>0 THEN LET X=X-(INKEY$
="7")
  55 IF X<16 THEN LET X=X+(INKEY
$="6")
 100 LET B=INT (RND*3)
 110 IF A>0 THEN LET A=A-(B=0)
 115 IF A<16 THEN LET A=A+(B=1)
 120 IF A=0 OR A=16 THEN GOTO 21
0
 125 IF A=0 OR A=16 THEN GOTO 21
0
 129 PRINT AT A,20;"    ";AT A+1,
20;"(93:1sp:94)";AT A+2,20;"((9r
:sp)";AT A+3,20;"(sp:9h)";AT A+4
,20;"(sp:94)";AT A+5,20;"    "
 130 IF INKEY$<>"0" THEN GOTO 20
0
 140 PRINT AT X+2,2;"(9s)"";AT
X+1,4;"BANG";AT X+1,4;"    "
```

```
 150 FOR N=3 TO 30 STEP 5
 160 PRINT AT X+2,N;"""";AT X+2,
N;" "
 165 IF A=X OR A+1=X AND N=28 TH
EN GOTO 600
 170 NEXT N
 200 IF A<>X THEN GOTO 40
 210 IF B<>2 OR A<>X THEN GOTO 4
0
 220 PRINT AT A+3,19;"""(9s)";AT
 A+2,15;"BANG";AT A+2,15;"    "
 230 FOR N=19 TO 1 STEP -5
 240 PRINT AT A+3,N;"""";AT A+3,
N;" "
 250 NEXT N
 260 PRINT AT X,0;"(4*sp:isp:2*s
p)";AT X+1,0;"   rip  ";AT X+2,0
;"(4*sp:isp:2*sp)";AT X+3,0;"
""(isp)""";AT X+4,0;"  ""   """;
AT X+5,0;" ""      """;AT X+6,0;"
  """"""""""
 290 FOR N=1 TO 100
 300 IF N=50 THEN PRINT AT 0,0;"
YOU KILLED ";Q;" MEN"
 305 IF N=50 AND Q=1 THEN PRINT
AT 0,14;"A"
 310 NEXT N
 320 PRINT AT 0,0;"DO YOU WANT A
NOTHER GO? (Y/N)"
 330 IF INKEY$="N" THEN GOTO 360
 340 IF INKEY$="Y" THEN GOTO 20
 350 GOTO 330
 360 PRINT AT 0,0;"GOODBYE
                          ";
 370 PAUSE 100
 380 PRINT " FOREVER..."
 390 PAUSE 100
 400 CLS
 405 FOR N=17 TO 21
 406 PRINT AT N,0;"(21*9h)"
 407 NEXT N
 410 LET Z=9
 415 FOR X=-5 TO 18
 420 PRINT AT 5,Z+5;" *";AT 6,Z+
4;" /";AT 7,Z+3;"(sp:98:isp)";AT
 8,Z+2;"(sp:99:3*isp:9w)";AT 9,Z
+1;"(sp:99:5*isp:9w)";AT 10,Z;"(
sp:99:7*isp:9w)";AT 11,Z;"(sp:9*
isp)";AT 12,Z;"(sp:3*isp)bomb(2*
isp)";AT 13,Z;"sp:9*isp)";AT 14,
Z;"(sp:9r:7*isp:9e)";AT 15,Z+1;"
(sp:9r:5*isp:9e)";AT 16,Z+2;"(sp
:9r:3*isp:9e)"
 499 IF X>=1 THEN PRINT AT 13,X-
1;"(sp:93:99:94)";AT 14,X;"(sp:9
e)>";AT 15,X;"(sp:9f)";AT 16,X;"
(sp:9w)"
 510 IF X>=7 THEN PRINT AT 15,X;
"(sp:9f:9s)"
 520 PRINT AT 5,Z+6;"X";AT 5,Z+6
;"+"
 530 IF X>=7 THEN LET Z=Z+1
 550 NEXT X
```

```
 555 PRINT AT 15,X;"(9f:sp)"
 560 FOR N=1 TO 8
 562 PRINT AT N+13,21;"(9*isp)"
 565 NEXT N
 566 FOR N=1 TO 17
 567 PRINT AT N+4,21;"          "
 570 NEXT N
 572 PRINT AT 11,X-7;"PHEW,THAT
WAS CLOSE.                      /"
 573 PAUSE 100
 574 PRINT AT 11,X-7;"

 "
 576 FOR N=1 TO 17
 578 PRINT AT N,18;"(3*isp)"
 580 NEXT N
 582 FOR N=17 TO 1 STEP -1
 583 PRINT AT N,18;"   "
 584 NEXT N
 585 PRINT AT 12,10;"(7*sp:isp:2
9*sp:isp:ir:ii:ip:isp:29*sp:isp:
31*isp:isp:28*sp)THE(isp)END"
 586 FOR N=1 TO 12
 587 PRINT AT 21,0;"(21*9h)"
 589 SCROLL
 590 NEXT N
 595 PRINT AT 10,8;" we hope "
 599 STOP
 600 CLS
 605 PRINT AT A,20;"(2*sp:isp:2*
sp)";AT A+1,20;"(isp)rip(isp) ";
AT A+2,20;"(2*sp:isp:2*sp)";AT A
+3,20;" ""(isp)""";AT A+4,20;"""
   """;AT A+5,19;"""     """;AT
A+6,20;"""""""""""";AT X,0;"
";
 610 PRINT AT X+1,0;"(sp:9e)>";A
T X+2,1;"(9f:9w)";AT X+3,1;"(9w:
9e)"
 615 LET Q=Q+1
 620 PAUSE 300
 625 CLS
 630 GOTO 30
 640 STOP
 700 SAVE "GUNFIGHt"
 710 RUN
```

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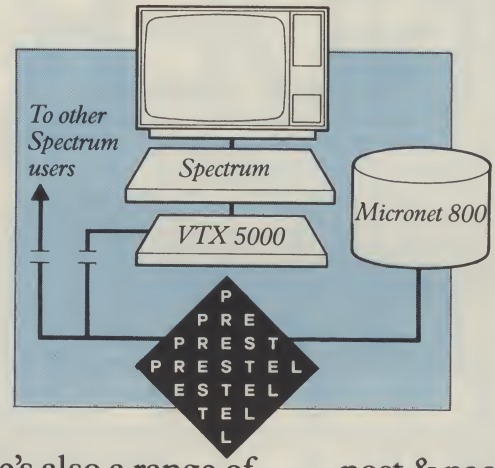

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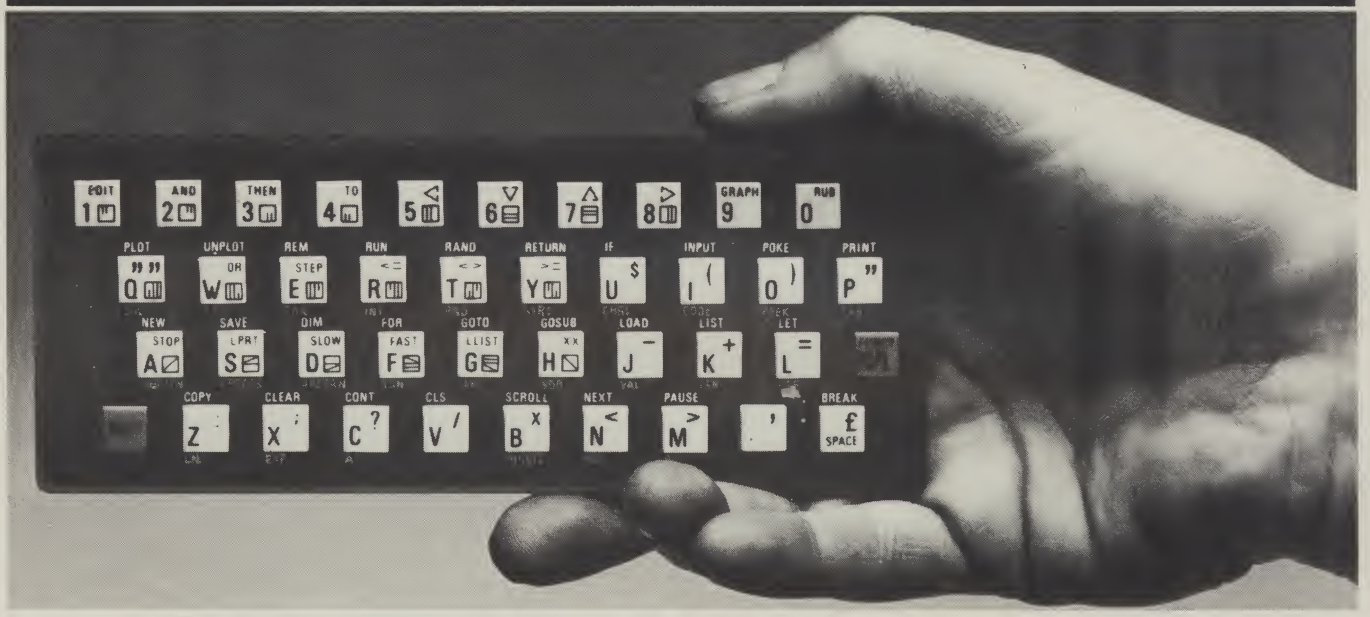
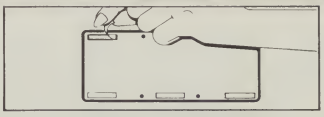
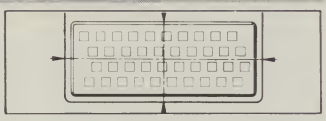


1. Make sure the original keyboard is clean and check that all the keys function.

2. The Buttonset is held in place by self-adhesive pads.



3. So all you do is remove the protective backing.



4. And place it centrally on your ZX81.

At last there's a really cheap but efficient way of ironing out the ZX81's only real bug: its keyboard. The Filesixty Buttonset offers:

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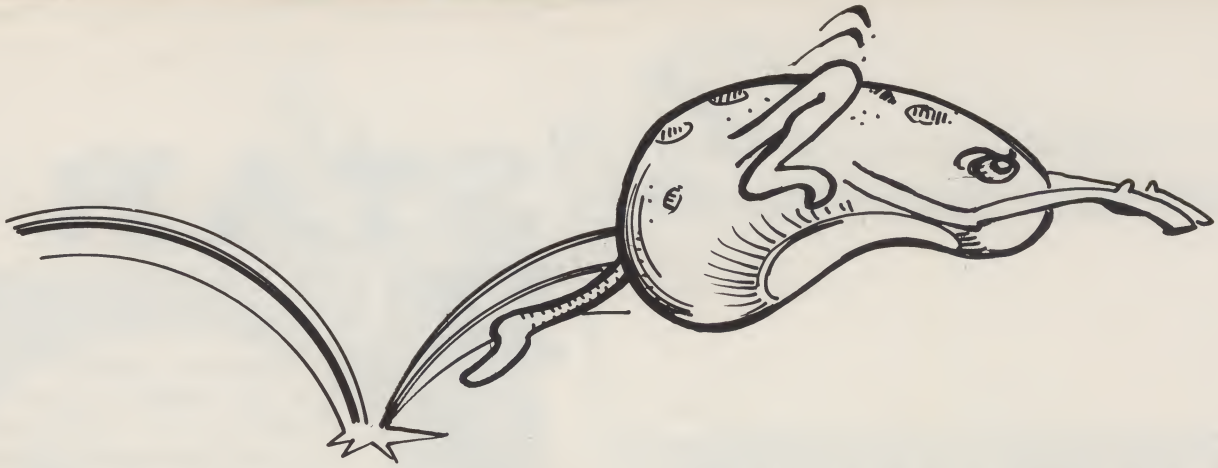
SIVERMAN THE SAILOR

JON HAZAN of Ealing, London has programmed his 16K Spectrum to write stories. They do not approach good literary style but they are amusing. So, if you like amusing short stories containing threats to the *Sinclair Programs* staff, program **Siverman the Sailor** into your computer.

```
1 DIM a$(6,100): DIM b$(6,100
): DIM c$(6,100): DIM d$(6,100):
 DIM e$(6,150): DIM f$(6,100)
   5 DATA " Makes Some Money","
Eats his Supper"," and the Bront
osaurus"," Goes Fishing"," Build
s a railway"," Becomes Prime-Min
ister"
   6 DIM g$(6,100)
  10 DATA " along the street ","
 along a train "," in the garden
 "," on HMS Pipe "," in a farmya
rd*"," round a bus "
  20 DATA " the roof fell in. ",
" his trousers fell down. "," so
meone threw him in the bin . ","
 he smoked his pipe. "," the pos
tman bit his dog. "," his next d
oor neighbour said ""shut up!"""
  30 DATA """Goodness me""","""O
h how rude !""","""That was my f
lower bed """,""""What a nice day
""","""What a strange person""",
""""Jump on your head"""
  40 DATA " pull the legs off my
 dog.""","  jump on my head.""","
 bite the postman.""","  make som
e elephant souffle.""","  'phone
my good friend singed cabbage.""
","  write off to Sinclair Progra
ms  and say if they do not publi
sh  my programs I will put them
in  my patent potato mincer"""
  50 DATA " bit the postman ","
put the Sinclair Programs
staff in a spinach pie"," jumped
 on his head "," ate some lunch
"," put his coat on "," caught a
 bus with his net "
  60 DATA " jumped on a train to
 Pimlico."," smoked a last pipe.
"," joined the anti-ZX81 league.
"," jumped on a radio-controlled
    antelope."," wrote to the BB
C"," threw his dog up the chimne
y."
  61 FOR a=1 TO 6
  62 READ a$(a): NEXT a
  63 FOR a=1 TO 6: READ b$(a): N
EXT a
  64 FOR a=1 TO 6: READ c$(a): N
EXT a
  65 FOR a=1 TO 6: READ d$(a): N
EXT a:
  66 FOR a=1 TO 6: READ e$(a): N
EXT a
  67 FOR a=1 TO 6: READ f$(a): N
EXT a
  68 FOR a=1 TO 6: READ g$(a): N
EXT a
  70 PRINT "SIVERMAN THE SAILOR"
  80 PRINT a$(INT (RND*6)+1)
  82 PRINT "One day Siverman the
 Sailor was walking"'b$(INT (RND
*6)+1)'"when suddenly"'c$(INT (R
ND*6)+1)'d$(INT (RND*6)+1)'"said
 Siverman. ""I think I shall"'e$
(INT (RND*6)+1)'" So Siverman"'f
$(INT (RND*6)+1)'" and "'g$(INT
(RND*6)+1)
```

```
   2 REM AWARI
   5 PAPER 5: INK 9: BORDER 1: C
LS
  10 GO SUB 9000
  20 GO SUB 5000
  30 INPUT ; FLASH 1;"Do you wis
h to go first (Y/N)";x$
  35 LET c=6: GO SUB 8000
  40 IF x$="y" OR x$="Y" THEN GO
 TO 200
  50 GO SUB 210: GO TO 400
 200 REM PRINT STATUS
 205 GO SUB 210: GO TO 300
 210 INK 9: BRIGHT 1
 220 FOR J=1 TO 7
 230 PRINT AT 7,((4*J)-3);"  "
 240 IF a(15-J)>0 THEN PRINT AT
7,((4*J)-3);a(15-J)
 250 NEXT J
 260 FOR J=1 TO 7
 265 PRINT AT 14,(1+(4*J));"  "

 270 IF a(J)>0 THEN PRINT AT 14,
(1+(4*J));A(J)
 280 NEXT J
 290 RETURN
 300 LET h=0: FOR x=1 TO 6: LET
h=h+a(x): NEXT x: IF h=0 THEN LE
T c=1: GO SUB 1000: GO TO 400
 305 IF z=6 THEN GO SUB 750: GO
TO 340
 310 INPUT ; FLASH 1;"Enter cup
number (1-6)";c
 320 PRINT AT 21,0;"You chose cu
p ";c
 330 IF c=0 THEN RUN
 334 IF C>6 OR C<1 THEN GO TO 30
0
 340 GO SUB 1000
 350 GO SUB 210
 400 REM COMPUTERS TURN
 401 IF Z=1 OR z=6 THEN GO TO 70
0
 402 IF Z=2 THEN GO TO 600

 403 IF Z=3 THEN GO TO 400
 404 IF Z=4 THEN GO TO 800
 405 IF Z=5 THEN GO TO 900
 408 REM MOVE LEVEL 3
 409 FOR J=1 TO 6
 410 IF A(14-J)<>0 THEN GO TO 44
0
 420 NEXT J
 430 GO TO 460
 440 LET C=14-J
 445 PAUSE 50: PRINT AT 21,17;"S
pectrum cup "; FLASH 1;7-J: PAUS
E 100: PRINT AT 21,0;"
                                "
 450 GO SUB 1000
 460 LET T=0: FOR X=1 TO 6: LET
 T=T+A(X): NEXT X: IF T=0 AND A(7
)>24 THEN CLS : PRINT AT 4,6;"A
W A R I   Level ";z;AT 10,7; FLA
SH 1;"YOU WIN ";A(7);" TO ";48-A
(7): GO TO 500
 461 LET T=0: FOR X=8 TO 13: LET
 T=T+A(X): NEXT X: IF T=0 AND A(
14)>24 THEN CLS : PRINT AT 4,6;"
A W A R I   Level ";z;AT 10,8; F
LASH 1;"I WIN ";A(14);" TO ";48-
A(14): GO TO 500
 462 IF A(7)+A(14)=48 THEN CLS :
 PRINT AT 4,6;"A W A R I   Level
 ";z;AT 10,12; FLASH 1;"A DRAW":
 GO TO 500
 470 GO TO 200
 499 STOP
 500 INPUT ; FLASH 1;"Press ENTE
R to play again.";x$: RUN
 600 REM MOVE LEVEL 2
 605 LET H=0
 610 FOR J=1 TO 6
 612 IF A(14-J)=J THEN GO TO 440
 615 IF A(14-J)>H THEN LET H=A(1
4-J)
 620 NEXT J
 630 FOR J=1 TO 6
 635 IF A(14-J)=H THEN GO TO 440
 640 NEXT J
 650 STOP
 700 REM MOVE LEVEL 1
 705 LET H=0
 710 FOR J=1 TO 6
 712 IF (A(14-J)+(14-J))>=14 THE
N GO TO 440
 715 IF A(14-J)>H THEN LET H=A(1
4-J)
 720 NEXT J
 730 FOR J=1 TO 6
 735 IF A(14-J)=H THEN GO TO 440
 740 NEXT J
 745 STOP

 750 REM AUTO move
 760 FOR c=6 TO 1 STEP -1
 762 IF A(c)+c>=7 THEN GO TO 795
 770 NEXT c
 780 FOR c=1 TO 6
 785 IF A(c)>0 THEN GO TO 795
 790 NEXT c
 795 PRINT AT 21,0;"You move cup
 ";c: PAUSE 50
 799 RETURN
 800 REM MOVE LEVEL 4
 810 LET J=INT (RND*6)+1
 820 IF A(14-J)<>0 THEN GO TO 44
0
 830 LET h=0: FOR x=1 TO 6: LET
h=h+a(14-x): NEXT x
 840 IF h>0 THEN GO TO 810
 850 GO TO 440
 900 REM LEVEL 5
 910 LET J=C
 920 GO TO 820

1000 REM MOVE USING CUP C
1001 IF A(C)=0 THEN RETURN
1005 GO SUB 8000
1010 FOR J=C+1 TO A(C)+C
1020 LET K=J
1030 IF J>14 THEN LET K=J-14
1040 LET A(K)=A(K)+1
1050 NEXT J
1060 LET A(C)=0
1070 IF NOT A(K)=1 OR NOT K=7 OR
 NOT K=14 THEN RETURN
1080 LET A(K)=A(K)+A(14-K)
1090 LET A(14-K)=0
1100 RETURN
5000 REM PRINT BOARD
5005 CLS
5010 PRINT AT 1,5;" A W A R I.";
TAB 20;"LEVEL ";Z
5015 GO SUB 6000
5020 PRINT AT 4,1; INK 1; BRIGHT
 1;"ST  6   5   4   3   2   1"

5030 LET a$="a  da  da  da  da
da  da  d"
5035 LET b$="b  fb  fb  fb  fb
fb  fb  f"
5040 LET c$="c__ec__ec__ec__ec__
ec__ec__e"
5050 PRINT AT 6,0; INK 7; BRIGHT
 1;a$;AT 7,0;b$;AT 8,0;c$;AT 13,
4;a$;AT 14,4;b$;AT 15,4;c$
5060 PRINT AT 17,1;; INK 1; BRIG
HT 1;"CUP 1   2   3   4   5   6
 ST"
5090 DIM A(14)
5100 FOR J=1 TO 14
5110 IF J=7 OR J=14 THEN GO TO 5
130
5120 LET A(J)=4
5130 NEXT J
5999 RETURN
6000 REM set-up UDG
```



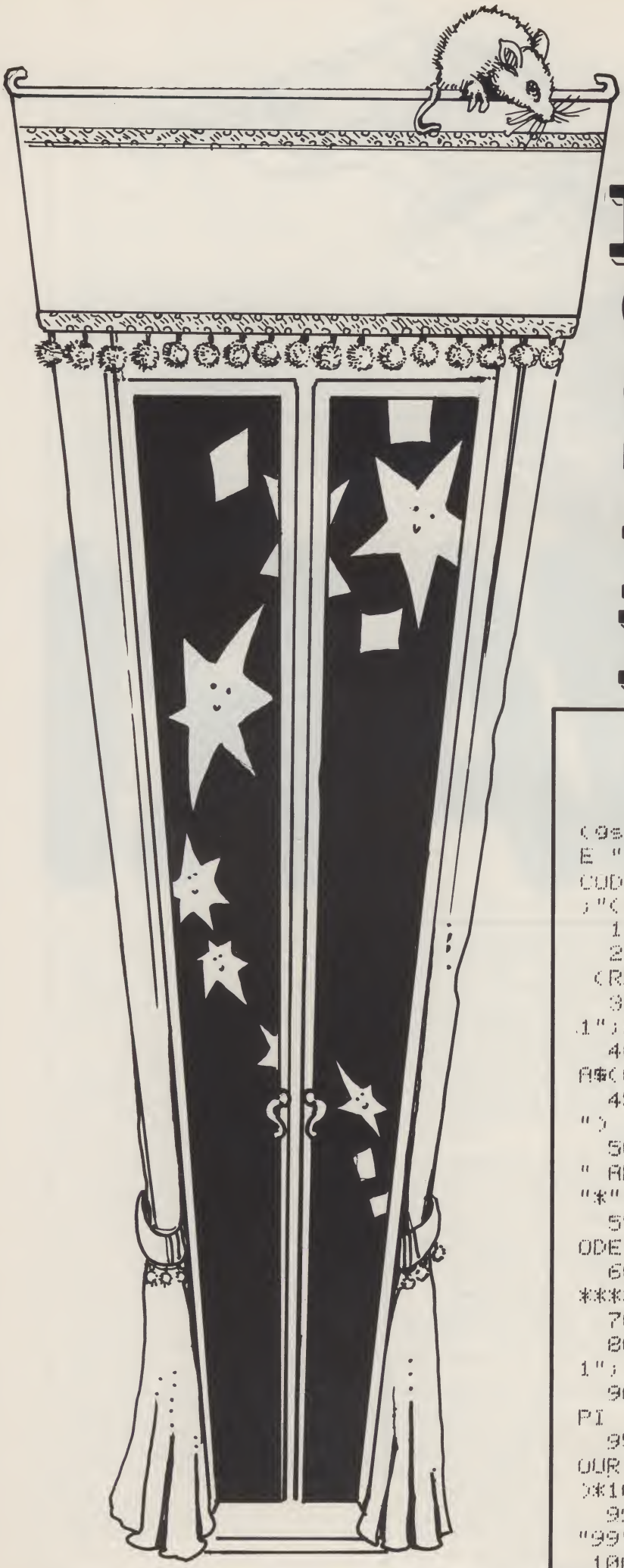
THE AIM of **Awari** is to finish with more beans in your score cup than the computer has in its score cup. You each begin with four beans in each of your six cups and an empty score cup each.

Choose a cup and the teams in it will be removed and distributed singly into the following cups. No bean can be removed from a score cup. Thus, if you choose bowl three initially it will be emptied and an extra bean will appear in bowl two, bowl one, your score bowl and the sixth computer bowl. Several levels range from easy to extremely difficult, and include an option for a demonstration game.

This professional-quality program was written for the 16K Spectrum by Terry Hainsworth of Radcliffe-on-Trent, Nottinghamshire.

AWARI

```
6010 FOR f=0 TO 6: FOR g=0 TO 7:
 READ a: POKE USR CHR$ (144+f)+g
,a: NEXT g: NEXT f
6020 DATA 96,144,16,16,16,16,16,
16
6030 DATA 16,16,16,16,16,16,16,1
6
6040 DATA 16,16,16,16,16,16,8,7
6050 DATA 6,9,8,8,8,8,8,8
6060 DATA 8,8,8,8,8,8,16,224
6070 DATA 8,8,8,8,8,8,8,8
6080 DATA 0,0,0,0,0,0,0,255
6090 RETURN
8000 REM sound
8010 BEEP .1,(c*3)-4: BEEP .1,c*
3: BEEP .1,(c*3)+4
8020 RETURN
9000 REM LEVEL OF PLAY
9010 CLS
9020 PRINT AT 13,0; FLASH 1;"PLE
ASE ENTER LEVEL OF PLAY"

9030 PRINT AT 16,3;"1 = HARD"
9040 PRINT AT 17,3;"2 = EASY"
9050 PRINT AT 18,3;"3 = EVEN EAS
IER"
9055 PRINT AT 19,3;"4 = BEAT THE
 MONKEY"
9057 PRINT AT 20,3;"5 = BEAT THE
 ZOMBIE"
9058 PRINT AT 21,3;"6 = DEMONSTR
ATION"
9060 INPUT Z
9064 IF Z<1 OR Z>6 THEN GO TO 90
00
9068 LET c=z: GO SUB 8000
9070 RETURN
9950 CLS
9960 CLEAR
9980 SAVE "AWARI" LINE 1
```



STAR SHOOTER

A NARROW WINDOW appears in the middle of the screen, through which can be seen a moving line of grey squares. Whenever a grey square appears between the markers in the middle of the window press any key to replace it with a star. When each of the 32 grey squares in the loop has been replaced by a star, and any squares which have appeared in the course of the game have been replaced, your skill percentage will be shown.

That will be lower if you have not pressed a key when a grey square has been between the markers, or if you have pressed a key when a star was between the markers.

Star Shooter was written for the 1K ZX-81 by Adam Freed of Bognor Regis, Sussex.

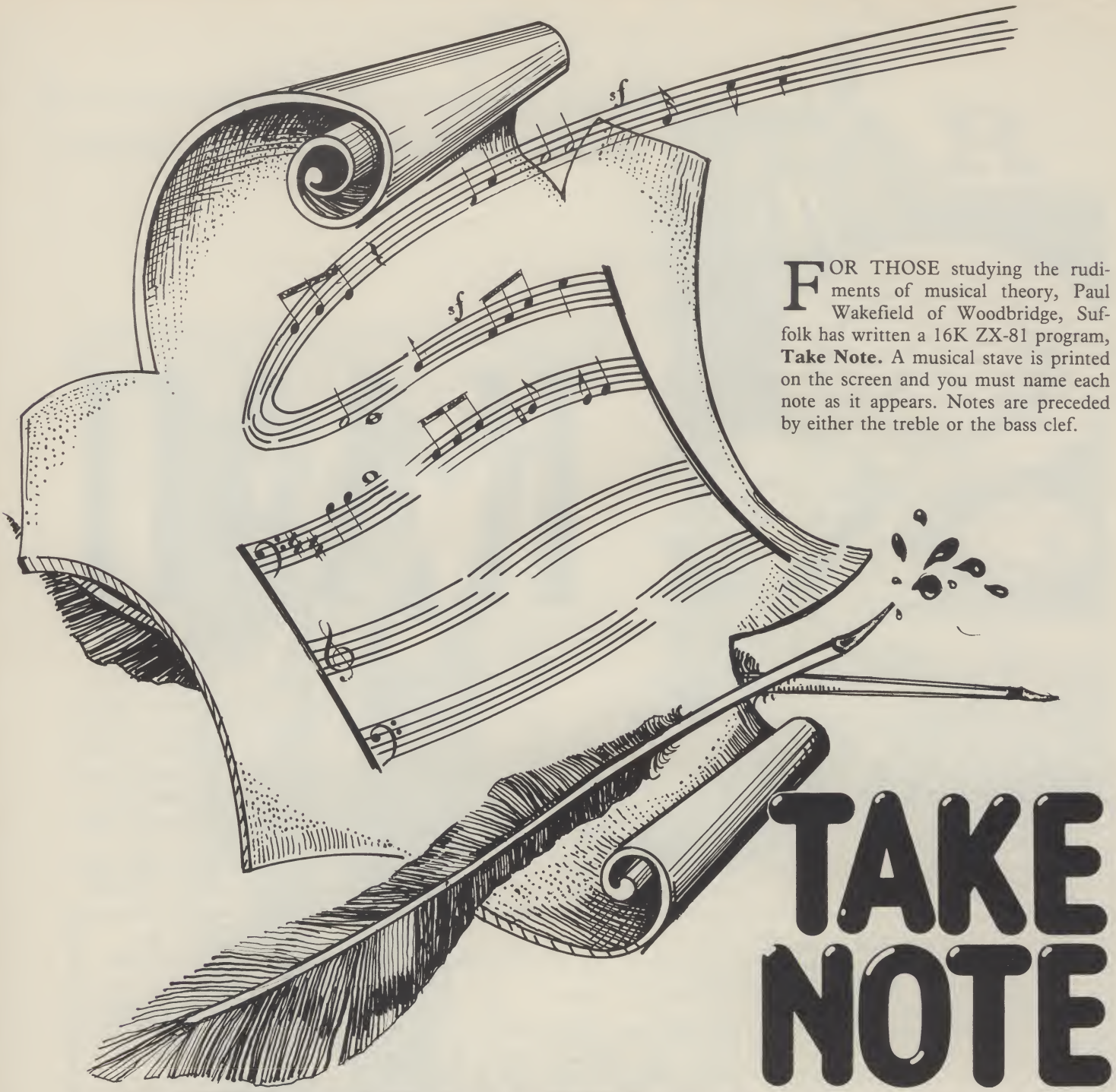
```
   2 CLS
   3 LET T=SGN PI
   4 LET S=T
   5 PRINT AT CODE "(9d)",CODE "
(9s)";"(5*isP:i+:5*isP)";TAB COD
E "(9s)";"(isP)";AT CODE "(9s)",
CODE "=";"(isP)";TAB CODE "(9s)"
;"(5*isP:i+:5*isP)"
  10 LET A$="(32*9h)"
  20 IF RND<.125 THEN LET A$(INT
 (RND*CODE "4")+SGN PI)="(9a)"
  30 PRINT AT CODE "(9s)",VAL "1
1";A$(CODE "£" TO CODE "=")
  40 LET A$=A$(CODE "(92)" TO )+
A$(CODE "(91)")
  45 LET T=T+(A$(CODE "?")="(9a)
")
  50 LET S=S+(A$(CODE "?")="(9a)
" AND INKEY$<>"")-(A$(CODE "?")=
"*" AND INKEY$<>"")
  55 IF INKEY$<>"" THEN LET A$(C
ODE "?")="*"
  60 IF A$="*****************
************" THEN GOTO VAL "80"
  70 GOTO CODE "="
  80 PRINT AT CODE "(9s)",VAL "1
1";"GAME*OVER"
  90 IF S<NOT PI THEN LET S=NOT
PI
  95 PRINT AT CODE "$",NOT PI;"Y
OUR SKILL PERCENTAGE=";INT ((S/T
)*100)
  99 IF INKEY$="" THEN GOTO VAL
"99"
 100 RUN
```

KAMI

FLY ACROSS enemy territory, shooting as many enemy saucers as possible before you are shot down or run out of fuel. Move up with "q" and down with "a". Saucers on the ground can be bombed with key "1" and those in the air shot with a laser, operated by key "p".

Kami was written for the 16K Spectrum by R Way of Salisbury, Wiltshire.

```
   2 LET hi=0: LET j=0: GO SUB 4
000: CLS
   3 LET q=0: LET score=0: LET c
=10: LET d=0: LET e=0: LET f=10:
 LET g=29: LET h=0: LET b$="AB "
   4 PRINT AT 20,0; INK 1;"(64*i
sP)"
   5 LET a=1: LET b=30
  20 LET a$="  E  FFFFF AB GGGG
 E GG E  G "
  30 FOR x=1 TO 30
  50 PRINT AT 19,0; PAPER 8; INK
 2;a$(a TO b);a$( TO a)
  55 IF e=19 AND PEEK 20587=7 TH
EN BEEP .05,50: BEEP .05,-10: BE
EP .05,-20: BEEP .05,-30: BEEP .
05,50: LET a$(13 TO 14)=" K": L
ET score=score+50
  56 IF e=19 THEN LET e=0
  60 LET a=a+1

  65 PRINT AT c,10; INK 2;"I";AT
 c,10;"J"
  70 PRINT AT c+1,10;"   ";AT c-
1,10;"   ";AT c,11; INK 1;"CD"
  75 PRINT AT c,10; INK 2;"H"
  76 IF IN 57342=254 THEN PLOT 1
06,170-(c*8): DRAW 140,0: INK 7:
 PLOT 106,170-(c*8): DRAW 140,0:
 BEEP .05,40: IF c=f AND b$="AB
" AND g>11 THEN LET score=score+
10: LET b$="K  "
  77 INK 0
  80 LET c=c+(IN 65022=254 AND c
<15)-(IN 64510=254 AND c>1)
  90 IF IN 49150=253 AND e=0 THE
N LET d=1: LET e=c+2
 100 LET e=e+((1 AND e<19) AND c
=1)
 110 IF d=1 THEN PRINT AT e-1,12
;" ";AT e,12;"■": IF e=19 THEN L
ET d=0
 120 PRINT AT f,g;b$

 130 LET g=(g-.5 AND g>0): IF g=
0 THEN PRINT AT f,g;"   "
 140 IF l>1 AND x=15 THEN PLOT 1
52,24: DRAW -130,130: INK 7: PLO
T 152,24: DRAW -130,130: BEEP .0
5,50: IF c=10 OR c=11 OR c=12 TH
EN GO TO 3000
 150 INK 0
 160 PRINT AT 0,7;"  ";AT 0,0;"F
UEL = ";20-q;AT 0,15;"SCORE = ";
score
 170 IF c=f AND INT (g)=12 THEN
GO TO 3000
 180 IF l>2 AND x=10 THEN PLOT 1
25,24: DRAW -110,110: INK 7: PLO
T 125,24: DRAW -110,110: BEEP .0
5,50: IF c=15 OR c=14 THEN GO TO
 3000
 190 INK 0
1000 NEXT x
1002 LET h=h+1

1005 IF h=2 THEN LET f=INT (RND*
14+2): LET g=29: LET h=0: LET b$
="AB "
1010 PLOT 207,24: DRAW -130,130:
 INK 7: PLOT 207,24: DRAW -130,1
30: BEEP .05,50: IF c=5 OR c=4 O
R c=3 THEN GO TO 3000
1020 INK 0
1100 LET q=q+1
1110 IF q=20 THEN GO TO 3000
2000 GO TO 5
3000 INK 0: PRINT AT c,9;"  K  "
;AT c-1,9;".     ";AT c+1,9;"
 ": FOR x=30 TO 1 STEP -1: BEEP
1/x,x: NEXT x
3010 IF score>hi THEN LET hi=sco
re: CLS : PRINT AT 8,8;"CONGRATU
LATIONS": PRINT AT 10,3;"YOU HAV
E A NEW HIGH SCORE": INPUT "PLEA
SE ""ENTER"" YOUR NAME";n$

3040 CLS : PRINT AT 10,0;"HIGH S
CORE ";n$;" =-";hi
3050 PRINT AT 12,0;"SCORE = ";sc
ore
3060 INPUT "Do you want another
game ? (y/n)";m$
3070 IF m$="y" THEN CLS : GO TO
3
3080 STOP
4000 PRINT AT 0,14;"KAMI"
4010 INPUT AT 10,0;"SELECT LEVEL
 OF PLA↑ (1 TO 3)";l
4020 IF l=1 OR l=2 OR l=3 THEN G
O TO 5000
4030 GO TO 4010
5000 FOR x=USR "A" TO USR "K"+7
5010 READ r: POKE x,r: NEXT x
5020 RETURN

5030 DATA 7,31,63,31,7,5,9,17,19
2,240,248,240,192,64,32,16,224,1
12,120,124,255,255,127,0,0,0,48,
72,254,255,254,0,128,64,36,20,12
,62,62,42
5040 DATA 170,255,255,170,255,25
5,85,85,16,16,56,56,56,124,56,84
,0,0,176,12,71,23,4,80,0,128,16,
164,11,47,144,64,0,64,168,68,147
,67,148,104,40,74,17,92,29,44,20
,130
```



TAKE NOTE

FOR THOSE studying the rudiments of musical theory, Paul Wakefield of Woodbridge, Suffolk has written a 16K ZX-81 program, **Take Note.** A musical stave is printed on the screen and you must name each note as it appears. Notes are preceded by either the treble or the bass clef.

```
  1 REM take note
  2 RAND
  3 PRINT "WHAT IS YOUR NAME?"
  4 INPUT N$
  5 CLS
 10 FAST
 15 FOR Y=10 TO 18 STEP 2
 20 FOR X=1 TO 30
 30 PRINT AT Y,X;"(96)"
 40 NEXT X
 50 NEXT Y
 60 LET CLEF=INT (RND*2+1)
 70 IF CLEF<>1 THEN GOSUB 600
 80 IF CLEF=1 THEN GOSUB 700
100 SLOW
300 FOR M=7 TO 30 STEP 3
305 LET N=INT (RND*11+1)
310 PRINT AT 20-N,M;"(isP)"
320 PRINT AT 21-N,M;"(isP)"
330 PRINT AT 1,1;"WHAT NOTE IS
THIS, ";N$;"?"
340 INPUT A$
350 IF N+P<5 THEN GOTO 400
351 IF N>9 AND P=2 THEN GOTO 36
5
360 IF CODE A$-33<>N+P THEN GOT
O 500
361 GOTO 370
365 IF CODE A$-28<>N THEN GOTO
500
370 PRINT AT 8,M;A$
380 NEXT M
390 GOTO 550
400 LET N1=N+7
410 IF CODE A$-33<>N1+P THEN GO
TO 500
420 PRINT AT 8,M;A$
430 NEXT M
440 GOTO 550
500 PRINT AT 1,1;"NOT QUITE RIG
HT. TRY AGAIN.    "
510 GOTO 340
550 CLS
555 PRINT AT 1,1;"WELL DONE ";N
$
560 PRINT "WOULD YOU LIKE SOME
MORE?"
561 INPUT Z$
565 IF CODE Z$<>62 THEN GOTO 90
0
566 CLS
570 GOTO 10
600 PRINT AT 11,1;"(93:97:94:sP
:94)"
610 PRINT AT 12,1;"(9w:96:94)"
620 PRINT AT 13,1;"(97:sP:98:sP
:94)"
630 PRINT AT 14,3;"(94)"
640 PRINT AT 15,2;"(93:91)"
650 PRINT AT 16,2;"(94)"
660 PRINT AT 17,1;"(98)"
670 PRINT AT 18,1;"(9w)"
680 LET P=2
690 RETURN
700 PRINT AT 8,3;"(9t:9y)"
710 PRINT AT 9,3;"(95:99)"
720 PRINT AT 10,3;"(9w:94)"
730 PRINT AT 11,3;"(2*95)"
740 PRINT AT 12,3;"(isP)"
750 PRINT AT 13,2;"(93:95)"
760 PRINT AT 14,2;"(2*9w)"
770 PRINT AT 15,1;"(9t:98:9e:9y
)"
780 PRINT AT 16,1;"(3*9w:94)"
790 PRINT AT 17,1;"(95:9w:95:98
)"
800 PRINT AT 18,1;"(9y:96:9w:9t
)"
810 PRINT AT 19,3;"(95)"
820 PRINT AT 20,1;"(93:91:95)"
830 PRINT AT 21,1;"(92:96:91)"
840 LET P=0
850 RETURN
900 CLS
910 PRINT AT 10,1;"GOODBYE ";N$
930 STOP
```

BANANA LEAP

BUNCHES of ripe bananas hang above you and a swamp lies beneath your feet. Move yourself left and right with the usual cursor keys to collect the bananas. Every time you land you will make a hole in the swamp, which you must avoid in the future.

Once you have gained 500 points an angry monkey will appear and begin to chase you, followed, once you have 1,000 points, by a second monkey.

Banana Leap was written for the 16K Spectrum by Adrian Elcock of Sheffield.

```
  1 GO SUB 400: GO SUB 500
  2 LET total=0: LET score=0
  3 LET x=1
  4 LET g$="H"
  5 LET c=20: LET d=5
  6 LET m=12: LET n=23
  7 LET p=12: LET q=7
 10 DIM a(3): DIM b(20)
 20 LET b$="*"
 30 FOR d=1 TO 3: LET a(d)=d: N
EXT d
 40 FOR e=1 TO 5: LET b(e)=e+2:
 NEXT e
 50 FOR f=6 TO 10: LET b(f)=f+4
: NEXT f
 60 FOR g=11 TO 15: LET b(g)=g+
6: NEXT g
 70 FOR h=16 TO 20: LET b(h)=h+
8: NEXT h
 75 FOR z=0 TO 31: PRINT AT 21,
z; INK 4; PAPER 7;"■": NEXT z
 80 PRINT AT a(1),b(2); INK 6;
PAPER 7;b$;AT a(1),b(4);b$;AT a(
1),b(6);b$;AT a(1),b(8);b$;AT a(
1),b(10);b$;AT a(1),b(12);b$;AT
a(1),b(14);b$;AT a(1),b(16);b$;A
T a(1),b(18);b$;AT a(1),b(20);b$
 90 PRINT AT a(2),b(1); INK 6;
PAPER 7;b$;AT a(2),b(3);b$;AT a(
2),b(5);b$;AT a(2),b(7);b$;AT a(
2),b(9);b$;AT a(2),b(11);b$;AT a
(2),b(13);b$;AT a(2),b(15);b$;AT
 a(2),b(17);b$;AT a(2),b(19);b$
 95 PRINT AT a(3),b(2); INK 6;
PAPER 7;b$;AT a(3),b(4);b$;AT a(
3),b(6);b$;AT a(3),b(8);b$;AT a(
3),b(10);b$;AT a(3),b(12);b$;AT
a(3),b(14);b$;AT a(3),b(16);b$;A
T a(3),b(18);b$;AT a(3),b(20);b$
 100 IF SCREEN$ (c,d)="*" THEN P
RINT AT c,d;" ": BEEP .01,d: LET
 score=score+10: LET total=total
+10
 105 PRINT AT 12,0;"____________
___________________"
 110 IF score=300 THEN GO SUB 70
0: LET score=0: GO TO 75
 120 IF ATTR (c,d)=60 THEN PRINT
 AT c,d;"_": BEEP .1,0: LET x=1
 130 IF SCREEN$ (c,d)=" " AND c=
21 THEN GO TO 600
 135 PRINT AT 0,2;"round score=
";score;TAB 21;"total=";total
 137 IF x=-1 THEN LET g$="J"
 138 IF x=1 THEN LET g$="H"
 139 IF c=1 THEN LET g$="I"
 140 PRINT AT c,d;g$
 145 IF total>=500 THEN PRINT AT
 m,n; INK 2;"K": BEEP .01,n
 147 IF total>=1000 THEN PRINT A
T p,q; INK 1;"K"
 150 IF c=1 THEN LET x=-1
 153 IF total>=500 AND c=m AND d
=n THEN GO TO 800
 156 IF total>=1000 AND c=p AND
d=q THEN GO TO 800
 160 PRINT AT c,d;" "
 162 IF total>=500 THEN PRINT AT
 m,n; INK 0;"_"
 164 IF total>=1000 THEN PRINT A
T p,q; INK 0;"_"
 165 LET c=c-x
 170 IF INKEY$="5" THEN LET d=d-
.5
 180 IF INKEY$="8" THEN LET d=d+
.5
 182 LET s=INT (RND*3)
 185 IF total>=500 AND d<n AND s
=1 THEN LET n=n-s
 187 IF total>=500 AND d>n AND s
=1 THEN LET n=n+s
 188 LET t=INT (RND*3)
 190 IF total>=1000 AND d<q AND
```

```
t=1 THEN LET q=q-s
 195 IF total>=1000 AND d>q AND
t=1 THEN LET q=q+t
 197 IF n=q THEN LET q=n-1
 200 GO TO 100
 400 PRINT AT 2,3; FLASH 1;"S P
E C T R U M  S W A M P "
 405 PRINT AT 5,5;"IN THE GAME O
F SWAMP, YOU  MUST GUIDE YOUR MA
N AS HE JUMPS  TO GET THE BANANA
S USING KEYS  FIVE AND EIGHT,BUT
 BE CAREFUL   NOT TO FALL THROUG
H THE FLIMSY  PLANKS OR THE SWAM
P WILL DEVOUR YOU."
 406 PRINT AT 12,5; FLASH 1;"BEW
ARE THE ANGRY MONKEY"
 410 PRINT AT 20,6; FLASH 1;"ANY
 KEY TO BEGIN"
 413 PAUSE 0
 417 CLS
 420 RETURN
 500 FOR k=0 TO 7: READ b: POKE
USR "h"+k,b: NEXT k
 510 DATA 24,36,153,126,24,100,1
32,4
 530 FOR k=0 TO 7: READ b: POKE
USR "i"+k,b: NEXT k
 540 DATA 68,40,42,29,29,234,8,4
 550 FOR k=0 TO 7: READ b: POKE
USR "J"+k,b: NEXT k
 560 DATA 4,132,100,24,126,153,3
6,24
 570 FOR k=0 TO 7: READ b: POKE
USR "k"+k,b: NEXT k
 580 DATA 18,42,18,124,184,184,1
68,255
 590 RETURN
 600 FOR x=0 TO 20: PRINT AT c-x
,d;"GLUG": BEEP .5,c-x: NEXT x:
CLS : PRINT AT 10,4;"YOUR TOTAL
WAS ";total: STOP
 700 CLS : BEEP .1,20: BEEP .1,1
7: BEEP .2,13: BEEP .2,13: BEEP
.1,13: BEEP .1,15: BEEP .1,17: B
EEP .1,18: BEEP .2,20: BEEP .2,2
0: BEEP .2,20: BEEP .2,17
 710 RETURN
 800 FOR a=0 TO 30: BEEP .01,a:
NEXT a: FOR a=30 TO -30 STEP -1:
 BEEP .01,a: NEXT a
 810 PRINT AT 10,3;"THE ANGRY MO
NKEY ATE YOU";AT 11,4;"YOUR TOTA
L WAS ";total: STOP
```

EXCHANGE RATE

THE EXCHANGE RATE between pounds sterling and U.S. dollars is fluctuating so wildly that speculation has been made illegal. You are determined to make as much money as possible in the next 20 days. To convert pounds to dollars enter the number of pounds to be converted. To convert dollars to pounds enter the number of pounds you wish to acquire as a negative number. If you try to convert more money than you possess you will be caught and arrested.

On the twentieth day your American accounts will be checked and if you have more than 30 dollars you will be arrested.

Exchange Rate was written for the 1K ZX-81 by David Cockburn of Middleton, Manchester.

```
  10 REM "EXCHANGE RATE"
  20 LET A=0
  30 LET B=150
  40 LET C=1000
  50 PRINT "exchange rate"
  60 FOR D=1 TO 20
  65 PRINT AT 1,0;"DAY ";D
  70 PRINT "YOU NOW HAVE £";C;"
AND $";INT A;"  "
  80 LET E=INT (RND*2)
  90 IF E=0 THEN LET B=(B+INT (R
ND*30))
 100 IF E=1 THEN LET B=(B-INT (R
ND*30))
 110 IF B<=5 THEN LET B=150
 120 PRINT "£1=$";B/100;"   "
 130 PRINT "HOW MUCH DO YOU WANT
TO EXCHANGE"
 140 INPUT F
 150 LET G=F*B/100
 160 LET A=A+G
 170 LET C=C-F
 180 IF A<0 OR C<0 THEN GOTO 100
0
 190 NEXT D
 200 CLS
 210 PRINT "YOU HAVE A TOTAL OF
£";C;" AND $";INT A;"  "
 220 IF A>30 THEN PRINT "YOU HAV
E BEEN ARRESTED FOR      HAVING
OVER $30"
 230 STOP
1000 PRINT "YOU HAVE BEEN CAUGHT
"
```

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2 extracts from *ZX Computing*, Oct/Nov '82

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The Times, Saturday 11th December 1982 (about Cassette 4)

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KALABRIASZ World's silliest card game, full of pointless complicated rules.
CUBE Rubik Cube simulator, with lots of functions including 'Backstep'.
SECRET MESSAGES This message coding program is very txip qexi jf.
MARTIAN CRICKET A simple but addictive game (totally unlike Earth cricket) in machine code. The speed is variable, and its top speed is very fast.

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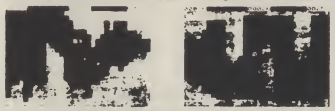
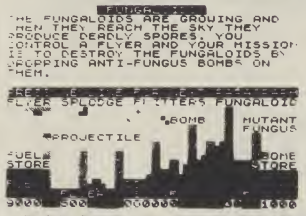
ZX-SCRAMBLE (machine code) with 3 stages.
Bomb and shoot your way through the fortified caves.



GUNFIGHT (machine code)

INVADERS (machine code)



GALAXY INVADERS (machine code)
Fleets of swooping and diving alien craft to fight off.

SNAKEBITE (machine code)
Eat the snake before it eats you. Variable speed. (very fast at top speed).

LIFE (machine code)
A ZX81 version of the well known game.

3D TIC-TAC-TOE (Basic)
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7 of the 8 games are in machine code, because this is much faster than Basic. (Some of these games were previously available form J. Steadman).

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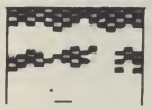
BYTE-MAN (machine code)
(previously available from Mindseye)

BREAKOUT (machine code)



SPACE RESCUE (machine code)
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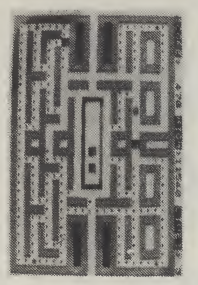

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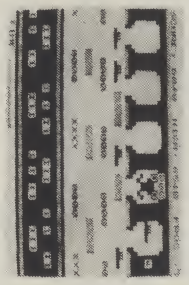

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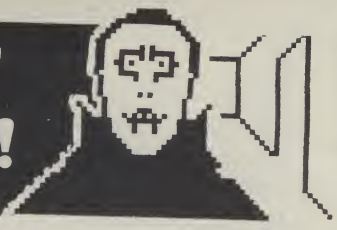

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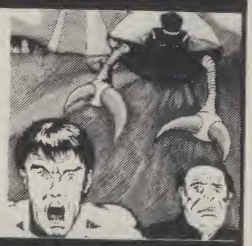

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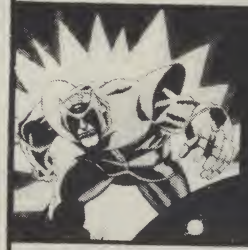

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